City of Menlo Park
Climate Change Action Plan
2009

Prepared by ICLEI - Local Governments for Sustainability USA.

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ICLEI-Local Governments for Sustainability is a membership association of 1,000 local governments worldwide—500 in the United States—committed to advancing climate protection and sustainability. Through technical expertise, direct support, and the innovation and evolution of tools, ICLEI strives to empower local governments to set and achieve their emissions reduction and sustainability goals.

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Executive Summary

Setting the Local Context

As global average surface temperatures rise as a result of increasing concentrations of greenhouse gases, climate patterns are shifting both globally and locally. Bay Area local governments, including Menlo Park, should expect to see an increase in the severity and unpredictability of storm and fire events, a smaller, less stable water supply, and a one to three foot rise in the water surface level of the San Francisco Bay by 2100.

Local governments play a key role in reducing greenhouse gas emissions, as they have direct or indirect control over many of the sources of emissions. In California, the State is preparing for aggressive climate change mitigation strategies and has identified local governments as key partners in this effort. The City of Menlo Park has committed to doing its part to reduce greenhouse gas emissions and is currently implementing a suite of programs and projects across multiple sectors that are helping reduce greenhouse emissions. The aim of this report is to demonstrate where Menlo Park stands now regarding current climate protection strategies, and then to identify effective near and medium term reduction goals and the strategies needed to achieve these goals. To that end, the plan outlines an equal mix of existing, planned, and proposed strategies that highlight current successes and establishes continuity between existing strategies and the proposed near-term strategies. With this plan, Menlo Park is well positioned to successfully reduce emissions at a local level, contributing both to State and global efforts to prevent catastrophic climate change.

Structure of the Report

This report is structured into sections as follows:

- Section 1: Introduction – discussion of local context and the goals and objectives of the Plan
- Section 2: Inventory Summary – baseline inventory results for community-wide and government operations greenhouse gas emissions
- Section 3: Municipal Operations Strategies – energy, transportation, solid waste, water and other strategies
- Section 4: Community Strategies – energy, transportation, solid waste, water and other strategies
- Section 5: State and Regional Strategies – state and regional strategies and strategies that aim to reduce greenhouse gases
- Section 6: Greenhouse Gas Reduction Targets – options for Menlo Park
- Section 7: Implementation Recommendations – summary and timeline of strategies and implementation recommendations
- Section 8: Conclusion – summary of the report and suggested next steps

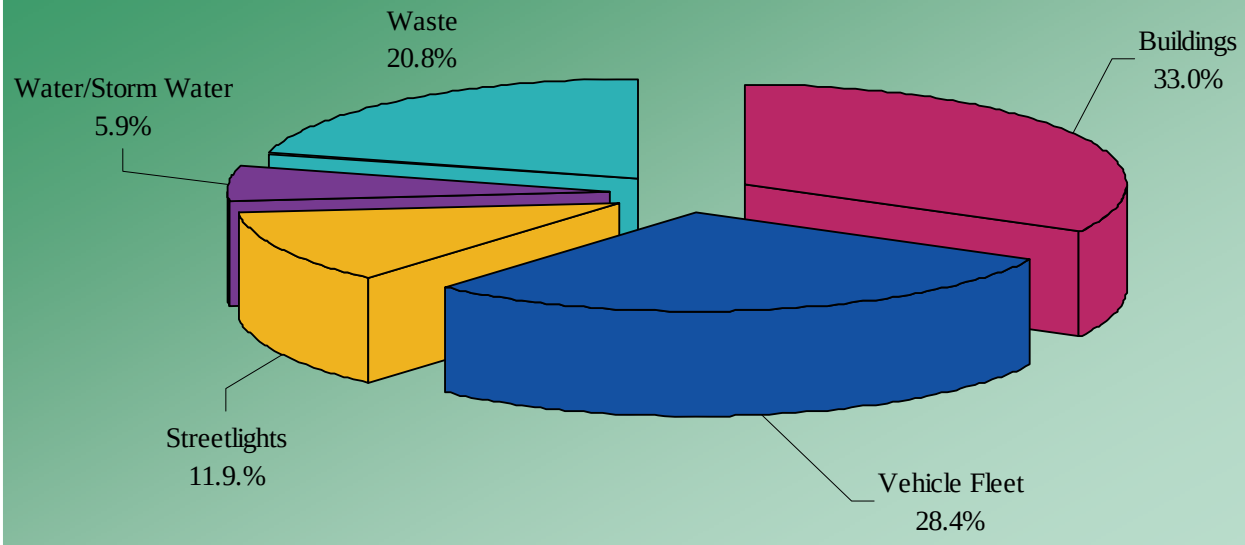
Both the municipal operations and community strategies sections include current, planned, and proposed strategies by sector, and go through the following analysis: overview, quantification, implementation, co-benefits, co-risks, and resources. Tables 15 and 16 provide a summary of near-term action strategies for municipal and community strategies, respectively. These recommended strategies are meant to complement and enhance strategies that are already underway, introduce new near and medium term strategies, as well as provide guidance on the continuation of strategies to assist Menlo Park in reaching its reduction targets into the future.

Baseline Emissions Inventory

Municipal Operations

In 2005, the City of Menlo Park's municipal operations generated 2,183 metric tons of CO_2e, not including the 41,748 metric tons of CO_2e emitted from the Marsh Road Landfill. Electricity and natural gas use in the City's buildings contributed 33.0 percent to total emissions, the vehicle fleet contributed 28.4 percent of this total, and the remainder came from waste, streetlights, and electricity for pumping water and stormwater.

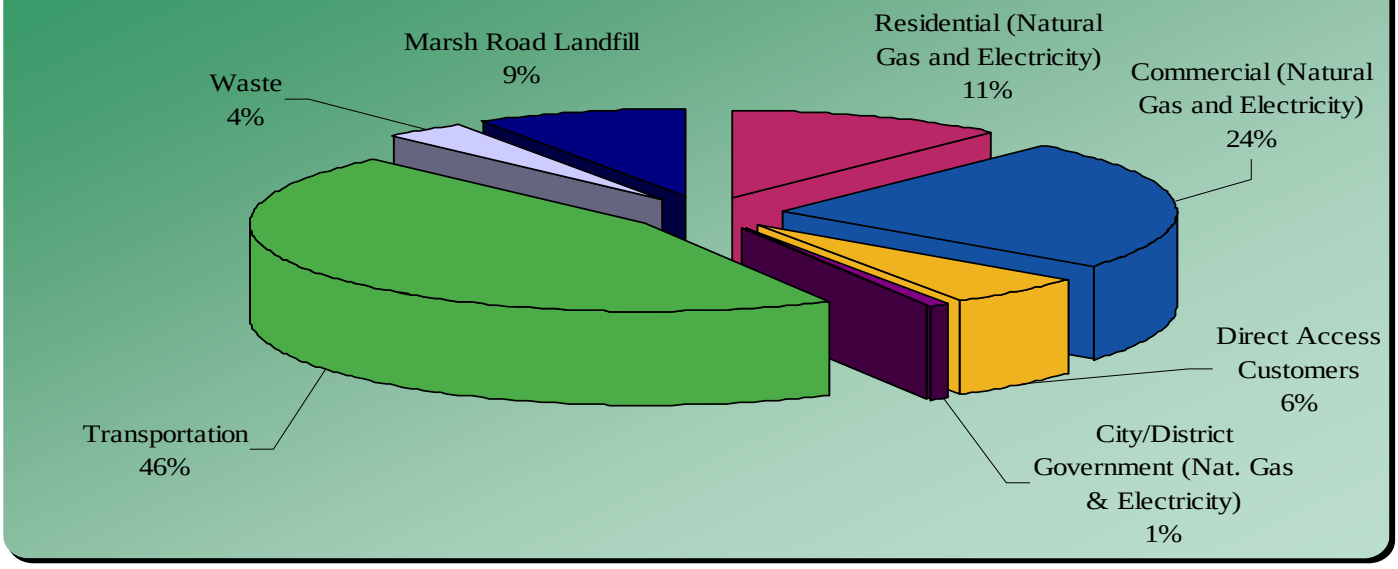
Figure 1: 2005 Municipal Operations Greenhouse Gas Emissions (excluding Marsh Landfill)



Community Emissions

In 2005, the community of Menlo Park emitted approximately 491,054 metric tons of CO_2e. Emissions from vehicles on Menlo Park's roads and highways constituted the majority (45.8 percent) of emissions in Menlo Park. Emissions from commercial and industrial buildings constituted approximately one-third of total community emissions (30.1 percent including Direct Access), while emissions from residences composed 11.4 percent of total emissions. Emissions from the closed Marsh Road Landfill (at Bayfront Park) contributed 8.5 percent of total emissions, and emissions from waste generated by Menlo Park homes and businesses composed 3.6 percent of total emissions.

Figure 2. 2005 Community Greenhouse Gas Emissions



Emission Reduction Targets

For both the municipal target and community target, ICLEI and the climate action plan team are putting forth two options for City Council to consider for adoption. The first option would require Menlo Park to adopt a target that is equal to the sum of the emissions reductions of all of the strategies described in this plan (for 2012 and 2020). For the second option, the City adopts a target in line with the State's goal to reduce emissions to 1990 levels by 2020; this is roughly equivalent to reducing emissions 15 percent below 2005 levels by 2020.

Table 1: Proposed Emissions Reduction Targets

Option 1: Community-Scale	Option 1: Municipal-Scale
Limit emissions increase to 4% above 2005 levels in 2012 *disregarding emissions decreases resulting from State and individual strategies*	**Reduce emissions 10% below 2005 levels by 2012 *disregarding emissions decreases resulting from State strategies***
Reduce emissions increase to 3% over 2005 levels in 2020 *disregarding emissions decreases resulting from State and individual strategies*	**Reduce Emissions 26% below 2005 levels by 2020 *disregarding emissions decreases resulting from State strategies***
Option 2: Community-Scale	**Option 2: Municipal-Scale**
Reach 2005 emissions levels by 2012	**Reach 2005 emissions levels by 2012**
Reduce Emissions to 15% below 2005 levels by 2020	**Reduce Emissions to 15% below 2005 levels by 2020**

Existing, Planned, and Proposed Emission Reduction Strategies

The tables below list the emission reduction strategies that are described in the body of this report.

Table 2: Municipal Operations Strategies

Strategy Name	Status
Roofing for City Buildings - Reflective and Energy Star	Proposed
Solar PV Panels for Corporate Yard	Planned
Replace Existing Streetights with LED Models	Proposed
Sharon Heights Water Supply Pump Station Upgrades	Planned
Solar Heating for Belle Haven Pool	Proposed
Enhance Transit Pass/Carpooling Programs	Proposed
Marsh Road Landfill Methane Emissions Mitigation	Existing
Enhancements to Recycling Collection Services	Planned
Install Water Efficient Fixtures in Municipal Facilities	Planned
PG&E ClimateSmart	Existing
Climate and Energy Coordinator	Proposed
Plant Trees	Existing and Planned
Environmentally Preferable Purchasing Program	Proposed
Green Fleet Policy	Proposed
Idling Policy	Proposed

Table 3: Community Strategies

Measure Name	Status
Residential Energy Audit Program (Green@Home)	Existing
Energy Efficiency and Renewable Energy Financing Program	Proposed
Electric and Plug-in Hybrid Vehicle Charging Stations	Proposed
Expand Community Shuttle Service	Planned
Implement Bike Improvements	Planned
Enhance Recycling Collection Services	Planned
Incentives for Building Practices that Reduce Energy Consumption Beyond Current Codes	Proposed
Early Implementation of CA Green Building Code Standards	Proposed
City Car Sharing Program	Proposed
Limit Commercial Vehicle Idling	Proposed
Transportation Demand Management Strategies	Existing and Proposed
Resident Education on Trip Reduction	Existing and Proposed
Transportation Management Associations	Proposed
Zero Waste Plan and Target	Proposed
Requiring Recycling Service for Commercial Facilities	Proposed
Construction & Demolition Debris Ordinance Update	Proposed
Menlo Park Municipal Water District Conservation Programs	Existing
Landscape Ordinance Update	Planned

The strategies listed as “existing” have been implemented by the City. The list should not be considered as all inclusive as the City has long operated and maintained its facilities and managed its programs with conservation of energy and natural resources as a primary objective.

Other potential strategies could include performance contracting, land use and building standards policies and Green Business certification. Those and other new or improved technologies will be evaluated for implementation in the City of Menlo Park if future updates to this document.

Moving Forward: Implementation

In order to make this plan a success, the City will need to develop an implementation plan for the strategies that includes the following:

- Implementation schedule
- Roles and responsibilities for each strategy
- Funding mechanisms to resource strategy implementation
- Monitoring and reporting mechanisms
- Community engagement strategy
- Process to identify and prioritize new strategies and update the Climate Action Plan

With this implementation plan in hand, the City will be able to effectively implement strategies, monitor progress, and make adjustments as necessary. This document should be updated during the City's 2009-10 fiscal year to present new information, refinements to the emission reduction calculations and targets, and new strategies to consider for implementation in subsequent years. In addition, the City should consider collaborating with other agencies to leverage resources for regional and local efforts, and to develop partnerships such as those described in the "San Mateo County Energy Strategy 2012."

Within five years, the City should also re-inventory emissions to monitor progress and reevaluate the Climate Action Plan to determine whether emissions reductions goals are being met and if they should be adjusted for the future.

Section One: Introduction

Introduction

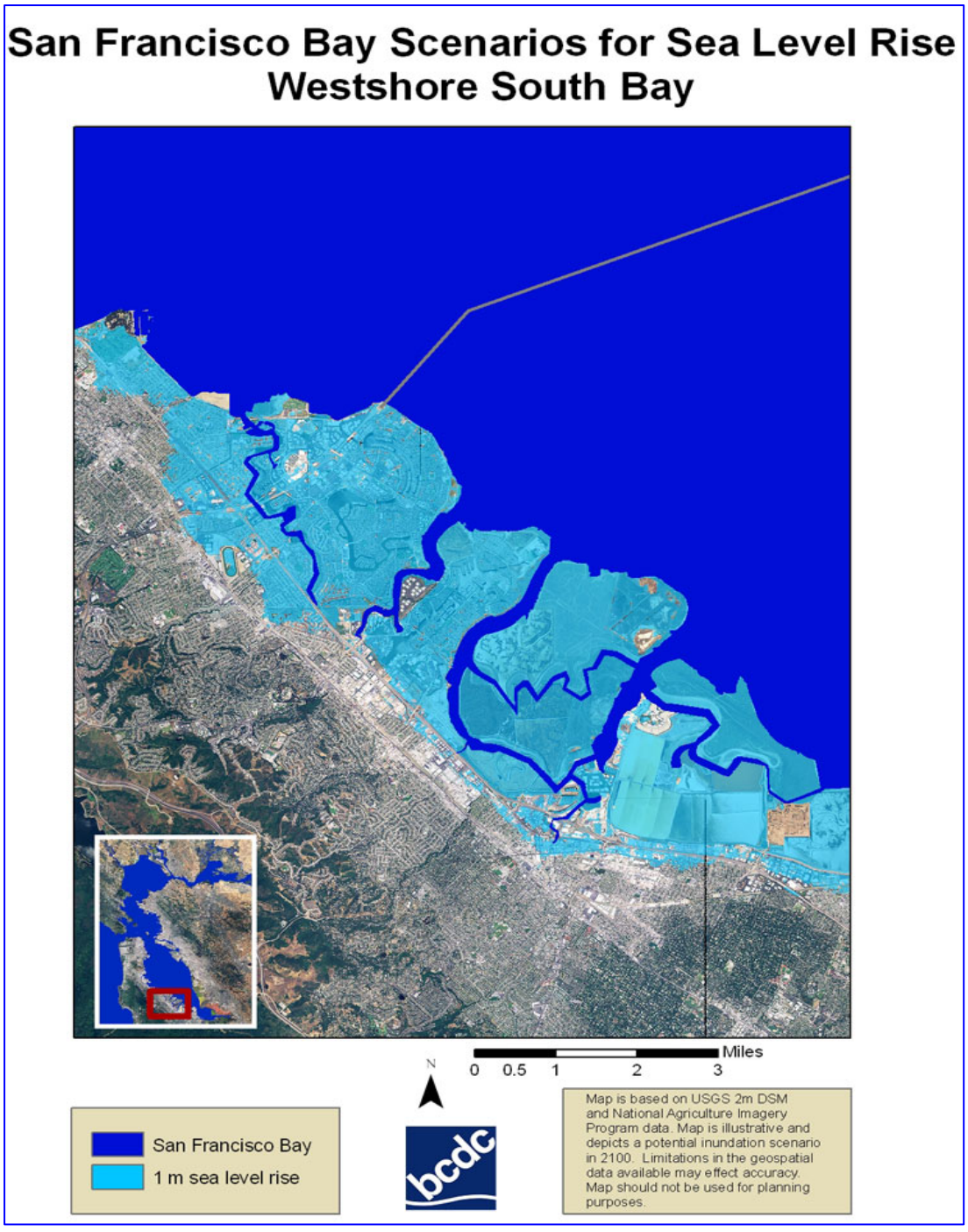
1.1 Setting the Local Context – Climate Protection in Menlo Park

1.1.1 Overview of Local Impacts of Climate Change

As global average surface temperatures rise as a result of greenhouse gases, climate patterns are shifting both globally and locally. Globally, these changes are expected to manifest in a number of ways; more extreme heat days, storm events, droughts and fires are expected, as is a rise in sea level. Shifting climate patterns will also affect natural ecosystems and agricultural production. San Francisco Bay Area local governments, including the City of Menlo Park, should expect to see an increase in fire events and a smaller, less stable water supply due to a decreasing snowpack in the Sierra Nevadas. Most notably will be the rise in the level of the San Francisco Bay, which experts predict will be between one and three feet by 2100.[1] The map below, developed by the Bay Conservation and Development Commission (BCDC), depicts the area in and around Menlo Park that would be affected by a one meter rise in the Bay.[2] While BCDC is working to protect many coastal areas in the Bay, sea level rise may have dramatic effects on Menlo Park, including more destructive storm surges and coastal flooding events.

[1] 2006 California Climate Action Team Report, BCDC.
[2] This analysis does not take into account tides or storm surges. The map is not meant to be used for planning purposes.

The specific strategies that the City chooses to take in the upcoming years should be motivated and guided by emission reduction targets for both the City's own operations and the community at large. Chapter 6 presents recommendations for greenhouse gas reduction targets based on political and financial feasibility, scientific/ecological imperative, local and regional growth patterns, current and future State strategies, input and willingness of stakeholders, and the targets of peer communities.


San Francisco Bay Scenarios for Sea Level Rise
Westshore South Bay
Miles
0 0.5 1 2 3
N
San Francisco Bay
1 m sea level rise
bcdc
Map is based on USGS 2m DSM and National Agriculture Imagery Program data. Map is illustrative and depicts a potential inundation scenario in 2100. Limitations in the geospatial data available may effect accuracy. Map should not be used for planning purposes.

1.1.2 Overview of Climate Action in California

Beginning in 2005, the State of California has responded to growing concerns over the effects of climate change by adopting a comprehensive approach to addressing emissions in the public and private sectors. This approach was officially started with the passage of the Global Warming Solutions Act in 2006 (AB 32), which required the State to reduce its greenhouse gas emissions to 1990 levels by 2020. It also required the California Air Resources Board (CARB) to regularly inventory emissions at a State level and create a plan for reducing these emissions. The bill authorized CARB to adopt and enforce regulations targeted at greenhouse gas emissions reductions in the public and private sectors.

The resulting AB 32 Scoping Plan was adopted in December 2008 established the following measures that the State will take to meet the greenhouse gas emissions reduction targets:

- Develop a California cap-and-trade program
- Expand energy efficiency programs
- Establish targets for transportation–related GHG emissions
- Support implementation of a high speed rail system
- Expand the use of green building practices
- Increase waste diversion, composting, and commercial recycling towards zero-waste
- Continue water efficiency programs and use cleaner energy sources to move and treat water
- Million Solar Roofs Programs
- Achieve a statewide renewable energy mix of 33%
- Develop and adopt the Low Carbon Fuel Standard
- Implement vehicle efficiency measures for light, medium, and heavy duty vehicles
- Adopt measures to reduce high global warming potential gases
- Reduce methane emissions at landfills
- Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation
- Capture of methane through use of manure digester systems at dairies

Other measures taken by the State have included mandating stronger vehicle emissions standards (AB 1493, 2002), establishing a low carbon fuel standard (EO # S-01-07, 2007), mandating a climate adaptation plan for the State (S-EO # 13-08, 2008), establishing a Green Collar Job Council, and establishing a renewable energy portfolio standard for power generation or purchase in the State. The State also has made a number of changes that will likely have potentially large effects on local governments:

- SB 97 (2007) required Office of Planning and Research to create greenhouse gas planning guidelines for the California Environmental Quality Act (CEQA). In addition, CARB is tasked with creating energy use and transportation thresholds in CEQA reviews, which will require local governments to account for greenhouse gas emissions when reviewing project applications.
- AB 811 (2007) authorized all local governments in California to establish special districts that can be used to finance solar or other renewable energy improvements to homes and businesses in their jurisdiction.
- SB 732 (2008) established a Strategic Growth Council which is charged with coordinating policies across State agencies to support a unified vision for land use development in the State. This vision will serve as a reference point for local land use policies.
- SB 375 (2008) mandated the creation of regional Sustainable Community Strategies (SCS) by regional planning agencies. The SCS' links regional housing and transportation planning processes in an attempt to meet regional greenhouse gas emissions targets.
- Additionally, the Attorney General's Office now requires that local governments examine local policies and large-scale planning efforts to determine how to reduce greenhouse gas emissions.

At this time it is not possible to quantify to what extent these initiatives will augment sector specific emission reductions strategies being planned for and implemented by local jurisdictions.

In the future, the State will be finalizing and implementing the policies outlined in the AB 32 Scoping Plan and developing a Climate Adaptation Strategy which will help to assess, mitigate

and plan for the impacts of climate change on local governments, residents, and businesses. Also, the Office of Planning and Research is currently developing guidelines on how to quantify and assess greenhouse gases during CEQA review of projects.

1.1.3 Strategies of the City Council, Menlo Park Staff and the GRCC

In January 2007, the City Council established nine goals for the coming year. One of the goals was "Environmental Stewardship," which included promoting and following sustainable environmental practices aimed at reducing greenhouse gas emissions, protecting the environment, and conserving natural resources. The Council also endorsed the U.S. Mayor's Climate Protection Agreement (with minor modifications) and received the "Greenhouse Gas Emissions Inventory Analysis" (Inventory), prepared by staff and ICLEI later that year.

The Menlo Park Green Ribbon Citizens Committee (GRCC) presented its "Report and Recommendations to Reduce Greenhouse Gas Emissions" to the City Council along with 32 recommendations marked "highest priority" out of a total of 130. The GRCC recommended that the City develop a Climate Action Plan (CAP) using the data from the Inventory and their report. The Climate Action Plan was envisioned to create a plan of specific strategies the City and the community might implement over a several year period aimed at reducing greenhouse gas emissions. This planning step is noted in the U.S. Mayor's Climate Protection Agreement:

> (The City) "will strive to the extent economically feasible to reduce global-warming pollution to a level equivalent to that designated by the Kyoto Protocol, which may involve taking actions in our own operations and community-wide, such as an Inventory of global-warming emissions in City operations and in the community, set reduction targets, and create an action plan."

In early 2008, the City Council resolved to develop a Climate Action Plan for Menlo Park. The City was awarded grant funding for this endeavor from the Bay Area Air Quality Management District and the San Mateo City/County Association of Governments.

1.2 Goals and Objectives of the Plan

1.2.1 Goals and Objectives

This Climate Action Plan is intended to be the starting point for the City of Menlo Park on its path to achieving significant greenhouse gas emission reductions. As the reader will notice as they browse through the planned and proposed emission reduction strategies, the policies, programs, and projects that this plan includes touch all aspects of the City's operations and life in the community at large. This is a reflection of the major undertaking that is required to enact meaningful reductions in emissions. It is important to recognize that a major determinant in the City of Menlo Park's success in reducing its greenhouse gas emissions will be the actions taken by regional, State, and national bodies across all sectors. Chapter 5 of this plan outlines some of the major State and regional efforts that are underway or will be shortly, and makes estimates as to what these efforts will mean in terms of emissions reductions for the community of Menlo Park. The strategies proposed in this plan are a starting point, rather than a comprehensive blueprint for how the City will achieve significant greenhouse gas reductions. Many strategies are described in detail in Chapter 3 (Municipal Operations) and Chapter 4 (Community). City Council and staff should take these ideas and the implementation recommendations presented in Chapter 7 and work to evolve and refine them in the upcoming years.

The specific strategies that the City chooses to take in the upcoming years should be motivated and guided by emission reduction targets for both the City's own operations and the community at large. Chapter 6 presents recommendations for greenhouse gas reduction targets based on political and financial feasibility, scientific/ecological imperative, local and regional growth patterns, current and future State strategies, input and willingness of stakeholders, and the targets of peer communities.

1.2.2 Focus on Short and Medium-Term Strategies

Efforts to reduce greenhouse gas emissions are motivated by the long term need to fundamentally change human behavior in order to avoid future catastrophic climate change scenarios, but current efforts at the local level are also about making our communities more

livable now. It is difficult to predict what policy developments will come into play at the regional, State, and national level more than 10 years into the future. The awakening of the global and national conscience on the importance of combating climate change has created a rapidly evolving technology and policy environment that is exciting because of the change that it promises, but can be stifling because of uncertainty surrounding the strategies of the most powerful stakeholder. It is for these reasons that this climate action plan is focused on near and medium term action that City staff, elected officials, residents, and businesses can take to do their part in contributing to the global effort to prevent catastrophic climate change and to consider the broader sustainability co-benefits that can accompany local climate protection efforts, such as cleaner air and water, healthier people, and local economic development.

For the purpose of this document and planning efforts, *short term* is being used to refer to a 1-3 year time horizon, while *medium term* refers to a 3-5 year time frame. There are some strategies in this plan that are not likely to implemented before 5 years, but these are the exception. Most of the emission reduction strategies in the section of this document that refers to planned State and regional strategies fall in the 5-10 year time horizon. While most of these strategies are still in draft form, they are included in this plan to provide a more complete picture of future policy scenarios and to aid in choosing appropriate emission reduction targets for the City of Menlo Park.

Many of the emission reduction strategies have significant unknowns and therefore, some uncertainty associated with the emission reduction estimates. Given limited time and resources, the authors of this document did their best to accurately estimate the emission reduction and cost implications of the proposed strategies. In the future, as the rigor of the methods and protocols for accounting for greenhouse gas emissions improves and moves towards standardization, the number and variety of emission reduction strategies that can be quantified will expand. An example of this is the estimate of emissions associated with the energy used to manufacture and transport all of the goods that individuals, businesses, and cities use. Within the next year, new protocols will be created and adopted by the State and other organizations, which detail how such emissions should be accounted for. Quantifying these emissions will increase the overall greenhouse gas footprint estimate for the City, but it will also expand the ways in which the City can reduce emissions, more realistically portraying the cause and effect between strategies and emissions.

1.2.3 Building Upon and Expanding Existing Programs

The City of Menlo Park is currently implementing a suite of programs and projects across multiple sectors that are helping to reduce greenhouse emissions. These include:

Green Building Display – The City continues to provide a green building display where residents and businesses can learn about green building materials. The display allows interested parties to see green building materials firsthand and to learn about materials that can be incorporated into local building projects.

Library Environmental Awareness Collection – The City's 2008-09 budget included $8,000 to supplement the City's collection of print, media and on-line resources within its two libraries.

Implementation of Green @ Home Program – The City's 2008-09 budget included $37,000 to implement an in-home energy and water audit program. The City's goal is to reach at least 250 households in 2008-09 with the program.

Elimination of Solar Permit Fees – In November 2007, the City eliminated all building permit fees related to the installation of photovoltaic systems installed in Menlo Park, as an incentive for property owners to install solar electricity generating capacity on their homes and businesses.

Climate Change Impact Documents – Staff is requiring that potential climate impacts be addressed in environmental documents for proposed major land use projects. The consultants assisting staff in the review of these documents have expertise in the area of climate change.

Building Code Exemptions for Green Building Techniques – Staff has approved the proposed use of green building techniques and materials in development projects that are not specifically prescribed in the Building Codes, but meet the intent of the codes. An example of an approved design is unventilated attics, which reduce air leakage and heat loss. While the 2007 California Building Code requires attic spaces to be ventilated, several unventilated attics have been approved as an alternate method for saving on heating costs.

Implementation of Green Building Check Lists – Funding was included in the City's 2008-09 budget to develop a phased system of green building checklists. The phases are: (1) voluntary submittal of LEED checklists for new non-residential projects over 10,000 square

feet—began in July 2008; (2) voluntary submittal of appropriate checklists of all new residential projects of more than 5 units and mixed use projects—began in October 2008; (3) mandatory submittal of appropriate checklists for all project types identified in phases 1 and 2—beginning January 2009; and (4) staff analysis of a required certification program for Council consideration of, and direction on, a mandatory program as a part of its project priority—consideration for 2009-2010. As part of the phased approach for proposed development projects, City Council also has approved money in the current fiscal year budget for the training of staff in green building practices.

Transportation - The City of Menlo Park has been creating and implementing programs to mitigate traffic congestion and air pollution since 1989. The City has been a leader in a number of different areas:

- CalTrain Shuttle Program (launched in 1989)
- Midday Shuttle Service (started in 1992)
- Door-to-Door Shopper's Shuttle Service for Seniors
- Alternative Commute Program for City Employees
- Development Fees on New Commercial Developments (to help fund the shuttle program)
- Transportation Demand Management (TDM) Strategies for New Commercial Developments
- Employer Assistance TDM Programs
- Mid-Peninsula Summit on Sub-Regional Transportation Issues (to enhance coordination among transit agencies in Palo Alto, East Palo Alto, Menlo Park and Stanford)

Recycling Programs

The City will continue to promote and assist commercial and residential customers with recycling and waste reduction programs, coordinating with the current contractor Allied

Waste/Republic Services. An extra effort will be initiated to inform residents and businesses that recycling containers are available at no extra charge. An ongoing effort will be made to inform residents that extra plant materials carts are available for a small fee. Paper/cardboard recycling bins will continue to be available to businesses and residents in the downtown parking lots. The City will also sponsor and promote electronics recycling drop-off events and household hazardous waste drop-off events at least three times per year. Recycling containers will continue to be provided in parks, along busy streets, throughout City facilities, and at public events. The City will continue to enforce its Construction and Demolition Recycling Ordinance requiring at least 60 percent of materials from certain projects to be salvaged or recycled.

Menlo Park Municipal Water District Water Conservation Programs

The City offers a number of free services and giveaways to customers of the Menlo Park Municipal Water District (MPMWD) to assist them with water conservation in homes, businesses and commercial facilities. The MPMWD serves approximately 10,000 of the City's residents, with the remainder served by California Water Service Company ("Cal Water"). The MPMWD and Cal Water are working together to deliver a consistent water conservation message within the City.

The strategies described in this plan are an equal mix of existing, planned, and proposed strategies. The climate action plan team responsible for the content of this document felt it was important to include current strategies in order to highlight successes and to show the continuity between strategies of the past and present and the proposed strategies for the near term future

1.2.4 Overview of How Strategies Were Selected

In April 2008, on the heels of the completion of the 2005 Greenhouse Gas Emission Inventory Report and the Menlo Park Green Ribbon Citizen Committee's (GRCC) presentation of their Climate Action Report and Recommendations, a Climate Action Plan team comprising ICLEI and City of Menlo Park staff was assembled to create a local climate action plan for Menlo Park's municipal operations and the community at large. Over the course of six months, the team met monthly to discuss in detail potential emission reduction strategies for inclusion in the climate action plan, during which time they drew on the work that was done by the GRCC, the

ICLEI baseline emission inventory report, and the experiences of local governments from across California and the United States.

The creation of a local climate action plan is a process that must employ open lines of communication to negotiate competing, complementary, and sometimes contradictory priorities. Unfortunately, no blueprint exists to guide the process of deciding which strategies to include. Among the several dozen local governments in the world that have created climate action plans, nearly as many approaches were employed. We came up with our approach for selecting strategies with careful consideration for the characteristics and priorities of the City of Menlo Park and the timeline and budget constraints we were working under, and the stakeholders for whom the plan was created for.

The primary selection criteria considered included the amount of annual greenhouse gas emission reduction, estimated cost for implementation ongoing and/or staff time required, cost savings, feasibility and benefits.

Section Two: Inventory Summary

Inventory Summary

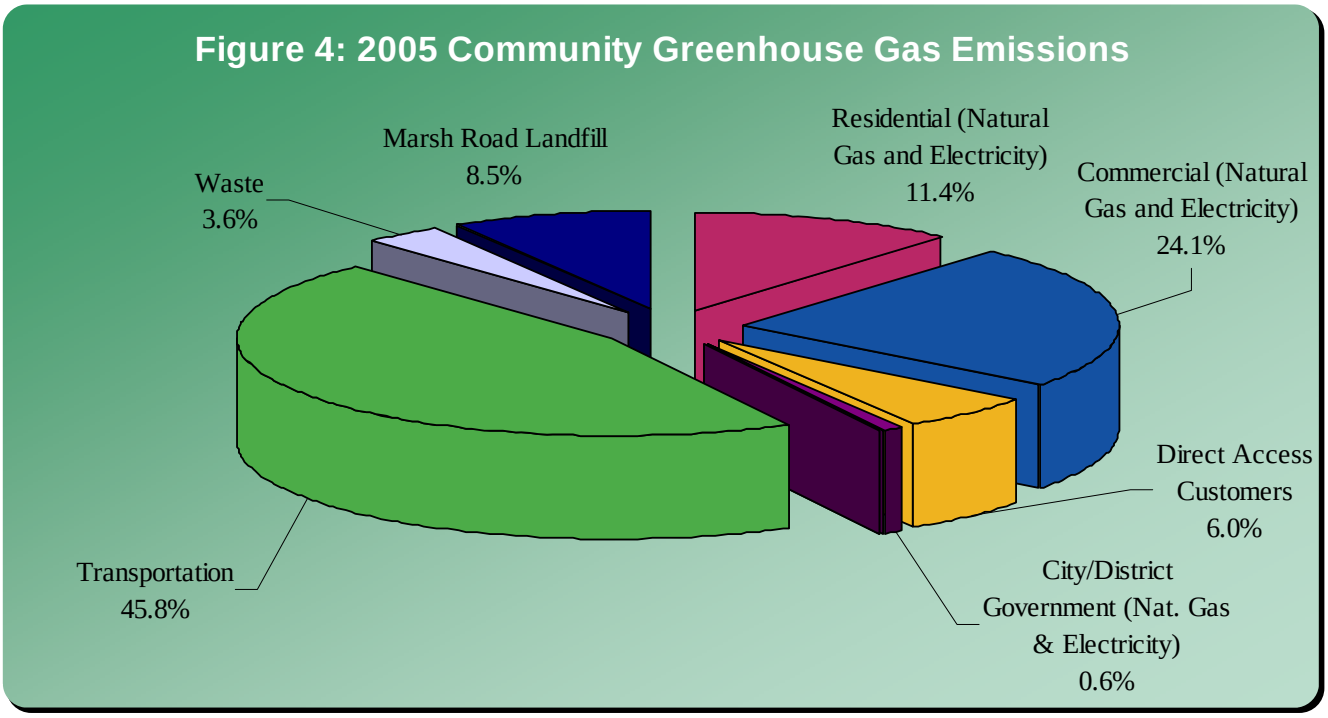
On June 26, 2007, the Menlo Park City Council adopted a resolution committing the City to taking action for climate protection. Through this resolution, the City recognized the “profound effect” that greenhouse gases emitted by human activity are having on the Earth’s climate, as well as the City’s opportunity to reduce these emissions, both through its municipal operations and by inspiring change throughout the community. Through energy efficiency in its facilities and vehicle fleet, alternative clean energy sources, waste reduction efforts, land use and transit planning, and other activities, the City of Menlo Park can achieve multiple benefits, including saving energy and money, reducing emissions, and preserving quality of life throughout the community. With the assistance of ICLEI – Local Governments for Sustainability, the City has begun its efforts to identify and reduce greenhouse gas emissions.

The first step toward reducing greenhouse gas emissions is to identify baseline levels and sources of emissions in Menlo Park, as well as the sectors of community and government operations that are responsible for the bulk of these emissions. This data will provide a baseline against which we will be able to compare future performance, enabling us to demonstrate progress in reducing emissions. Additionally, this information can inform the selection of a reduction target and possible reduction strategies.

2.1 Inventory Results

Presented here are estimates of greenhouse gas emissions resulting from our *community as a whole*, as well as those resulting from the City's *internal municipal operations*. Due to data availability and the desire to conduct a baseline inventory for the same year as other Bay Area cities, both community activity and municipal operations data are presented for the year 2005.

Figure 4: 2005 Community Greenhouse Gas Emissions



2.1.1 Community Emissions Inventory

In the base year 2005, the community of Menlo Park emitted approximately 491,000 metric tons of CO_2e.[3] [4] As shown in Figure 4 above, the Transportation (45.8%) and Commercial (24.1%) sectors were the largest sources of greenhouse gas emissions. Emissions from the Residential sector, Waste, and the closed Marsh Road Landfill (at Bedwell Bayfront Park) contributed 11.4%, 3.6%, and 8.5% respectively.

[3] This total includes estimated energy use for direct access utility customers and vehicle miles traveled on State highways in Menlo Park.

[4] All emissions estimated using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

Table 4: Community-Wide Emissions by Energy Source

Energy Source	CO_2e (%)	CO_2e (metric tons)	Energy (million BTU)
Gasoline	41.6%	204,158	2,830,801
Electricity	21.2%	104,164	1,590,238
Natural Gas	20.7%	101,589	1,909,387
Methane	8.5%	41,748	
Diesel	4.4%	21,437	253,200
Paper Products	2.1%	10,300	
Food Waste	0.7%	3,413	
Wood/Textiles	0.6%	2,730	
Plant Debris	0.3%	1,515	
Total	**100.0%**	**491,054**	**6,583,626**

Table 4 breaks down community-wide greenhouse gas emissions by energy source and waste type. The consumption of gasoline (35.8%), electricity (23.7%), and natural gas (23.1%) was responsible for the majority of emissions--cumulatively producing 82.6% of total greenhouse gas emissions in 2005. “Methane” in Table 4 represents the greenhouse gas emissions from Marsh Road Landfill. The remaining categories, with the exception of diesel, are landfilled materials that also emitted methane and carbon dioxide.

2.1.1.1 Per Capita Emissions

Dividing the total greenhouse gas emissions by population[5] yields a result of *16.37 metric tons CO_2e per capita*. It is important to understand that this number is not the same as the carbon footprint of the average individual living in Menlo Park.[6] It is also important to note that the per capita emissions number for Menlo Park is not directly comparable to every per capita number produced by other emissions studies because of differences in emission inventory methods.

[5] In 2005, Menlo Park’s population was approximately 30,000.
[6] Carbon footprint calculations include upstream lifecycle emissions, which were not included in this emissions inventory.

2.1.1.2 Criteria Air Pollutants

Menlo Park community's consumption of electricity and other fuels in local buildings and vehicles is also responsible for the release of criteria air pollutants, including nitrogen oxides (NO_X), sulfur oxides (SO_X), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM_{10}). The Transportation sector is responsible for the majority of NO_X, CO and VOC emissions, while energy used in buildings is primarily responsible for emissions of SO_X and PM_{10}.

Table 5. Criteria Air Pollutant Emissions in 2005

Sector	NO_x	SO_x	CO	VOCs	PM_{10}
Residential	31	23	34	5	19
Commercial[1]	194	73	89	12	60
Direct Access[2]	53	35	34	4	29
Transportation	660	43	8,121	757	17
Total	**938**	**174**	**8,278**	**778**	**125**

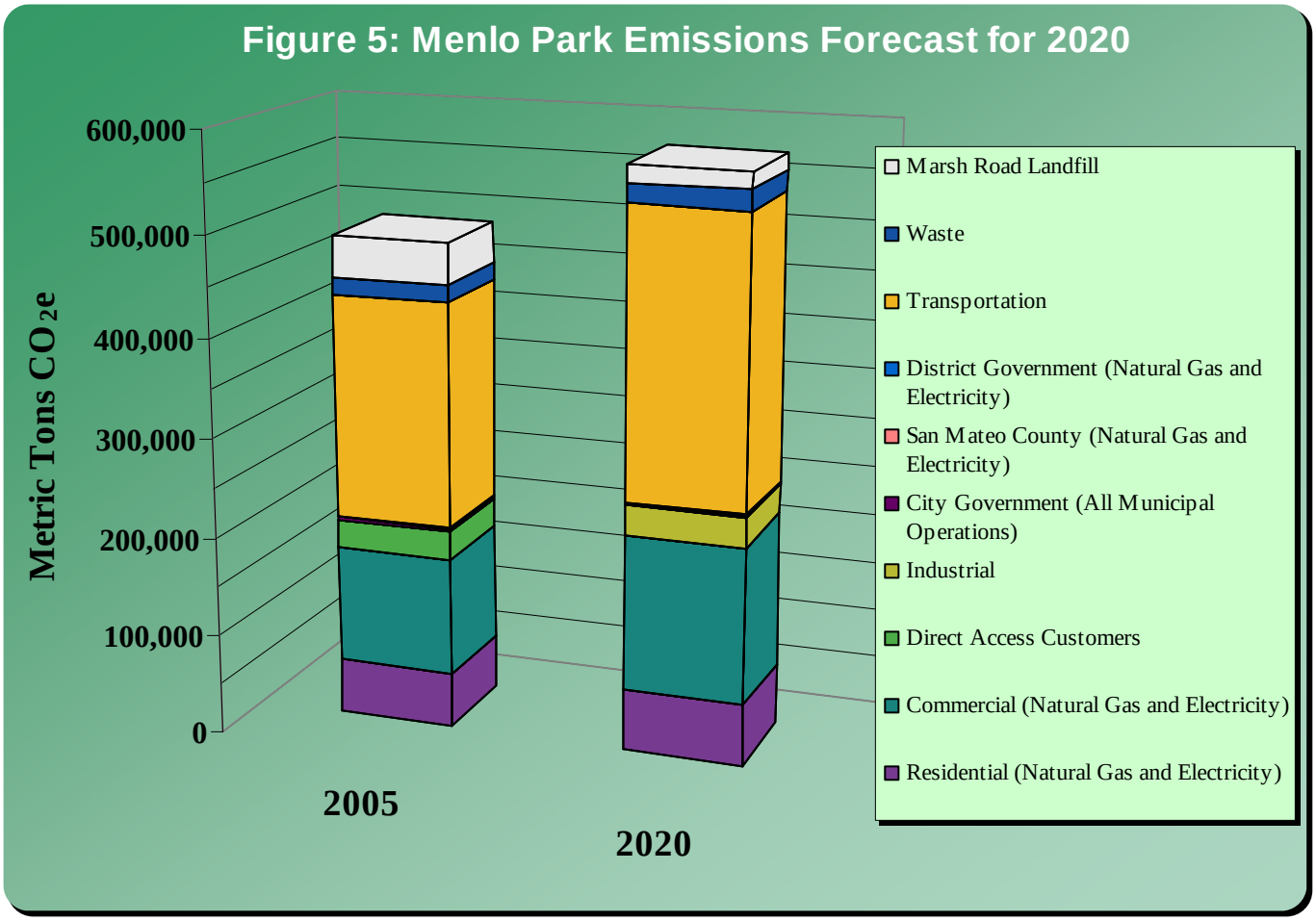
All units are in metric tons.

1 Includes City, County, and District Gov. Buildings.

2 Estimate, based on electricity usage that is 11% of the total of residential, and commercial/industrial sectors.

2.1.1.3 Community Emissions Forecast

Under a business-as-usual scenario, the City of Menlo Park's emissions will grow over the next decade and a half. To illustrate the potential emissions growth based on projected trends in energy use, driving habits, job growth, and population growth from the baseline year going forward, we conducted an emissions forecast for the year 2020, depicted below by Figure 5.[7]



[7] A variety of different reports and projections were used to create the emissions forecast, including information from the Association of Bay Area Governments (ABAG), and the California Energy Commission (CEC). Please see full Inventory Report for greater detail.

2.1.2 Municipal Operations Emissions Inventory

In the year 2005, the City of Menlo Park's municipal operations generated approximately 2,200 metric tons of CO_2e, in addition to an estimated 42,000 metric tons of CO_2e from Marsh Road Landfill.[8] Electricity and natural gas use in the City's buildings contributed 33.0%, the vehicle fleet contributed 28.4% of this total, and the remainder came from waste, streetlights, and electricity for pumping water and stormwater.

During 2005, the Menlo Park municipal government spent approximately $790,000 on electricity, natural gas, waste disposal, and fuel for its buildings, streetlights and vehicles. Beyond reducing harmful greenhouse gases, any future reductions in municipal energy use will have the potential to reduce this expense, enabling Menlo Park to reallocate limited funds toward other municipal services. Table 6, Figure 6, and Table 7 illustrate the breakdown of municipal emissions by sector.

Table 6: Municipal Operations Emissions Summary 2005

Sector	Greenhouse Gas Emissions (% CO_2e)	Greenhouse Gas Emissions (metric tons CO_2e)	Energy Equivalent (million Btu)	Cost ($)	Cost (%)
Buildings	33.0%	720	11,749	$323,990	41.0%
Vehicle Fleet	28.4%	621	8,009	$168,816	21.3%
Streetlights	11.9%	259	3,948	$130,783	16.5%
Water/Storm Water[1]	5.9%	128	1,951	$70,418	8.9%
Waste[2]	20.8%	455	-	$96,845	12.2%
TOTAL	**100.0%**	**2,183**	**25,657**	**$790,852**	**100.0%**
Marsh Road Landfill	-	41,748	-	-	-

1 See Appendix 2 for a detailed description of how Water/Storm Water numbers were calculated.

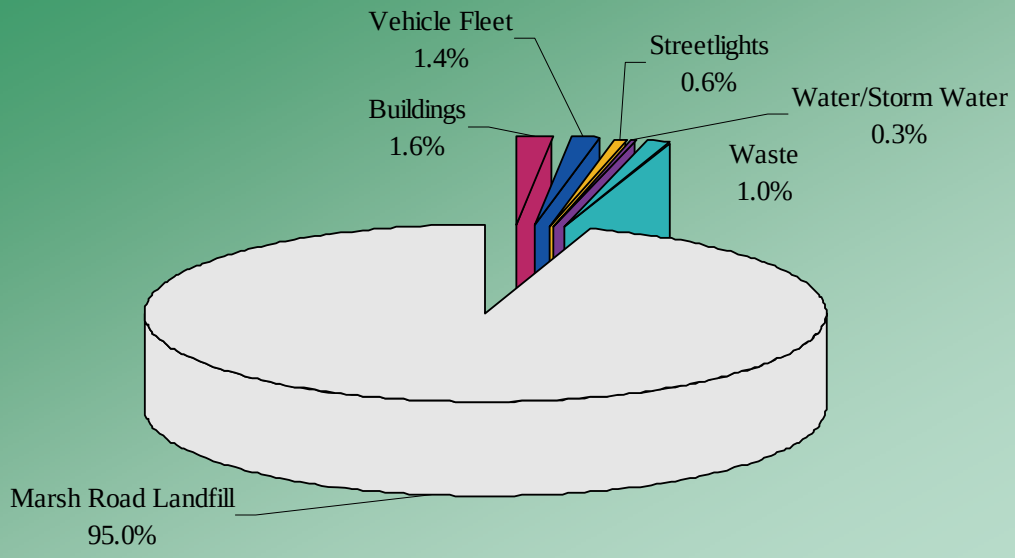
2 See Appendix 2 for a detailed description of how Waste numbers were calculated.

Municipal emissions in Menlo Park constitute 0.4% of the community's total greenhouse gas emissions (or 8.9% if the closed Marsh Road Landfill is included). This is not unusual; local government emissions typically account for around two percent of community levels. As a minor contributor to total emissions, strategies to reduce municipal energy use will have a

[8] Marsh Road Landfill and the Bayfront Park Methane Capture Station are owned by the City of Menlo Park. The Methane Capture Station is operated by Gas Recovery Systems Inc.

limited impact on the Menlo Park community's overall emissions levels. However, as previously mentioned, municipal action has symbolic value that extends beyond the magnitude of emissions actually reduced.

Figure 6: 2005 Municipal Operations Greenhouse Gas Emissions (including Marsh Landfill)



2.1.2.1 Criteria Air Pollutants

The City of Menlo Park was also responsible for the release of criteria air pollution in 2005, as shown below. These pollutants have been linked with various environmental and public health problems. Many of the strategies we might take to reduce greenhouse gas emissions will also have the additional benefit of reducing these pollutants as well.

Table 7: Municipal Operations Criteria Air Pollutant Emissions in 2005, City of Menlo Park

Sector	NO_X	SO_X	CO	VOCs	PM_{10}
Buildings	2,496	1,148	1,271	164	945
Streetlights	1,026	684	649	73	565
Vehicle Fleet	4,030	217	37,374	3,875	102
Water/Sewage	507	338	321	36	279
Total	**8,059**	**2,387**	**39,616**	**4,148**	**1,891**

All units are in lbs.

2.2 Key Findings

- The Menlo Park community as a whole was responsible for emitting approximately 491,000 metric tons of CO_2e in the base year 2005.
- The Transportation and Commercial building sectors together produced approximately 70% of total community emissions.
- The consumption of gasoline (35.8%), electricity (23.7%), and natural gas (23.1%) was responsible for producing an estimated 82.6% of total greenhouse gas emissions in 2005.
- In addition to producing nearly 500,000 metric tons of CO_2e, activities within the Menlo Park community in the year 2005 produced 10,293 metric tons of criteria air pollutants, effecting local air quality and public health.
- Dividing the total community greenhouse gas emissions by population[9] yields a result of *16.37 metric tons CO_2e per capita*.
- The results from the 2020 emissions forecast demonstrate that under a business-as-usual scenario, emissions will grow significantly in the Commercial and Transportation sectors.
- These results suggest that energy use in commercial buildings and vehicular travel present both the greatest challenge and require the most urgent action in order for the City to reduce its emissions in the future. Community climate action planning efforts should not neglect these sectors.
- The City of Menlo Park's own municipal operations were responsible for 2,200 metric tons of CO_2e in 2005, in addition to 41,748 metric tons of CO_2e from the Marsh Road Landfill.
- Municipal emissions in Menlo Park constitute 0.4% of the community's total greenhouse gas emissions (or 8.9% if Marsh Road Landfill is included).
- When including the Marsh Road Landfill, fugitive landfill emissions from this facility constitute approximately 95% of total municipal emissions.

[9] In 2005, Menlo Park's population was approximately 30,000.

- Excluding Marsh Road Landfill, the greatest percentage of municipal emissions came from the consumption of electricity and natural gas in City facilities (33.0%) and fuel consumption in the City vehicle fleet (28.4%).

- In addition to producing greenhouse gas emissions, Menlo Park operations generated 56,000 lbs. of criteria air pollutants in 2005.

Section Three: Municipal Operations Strategies

Municipal Operations Strategies

3.1 Municipal Operations Profile

Menlo Park, California is a city of 10 square miles, located in San Mateo County near the San Francisco Bay. In 2008, Menlo Park's population was approximately 32,000. The City operated with a staff of approximately 250, and an annual budget of $32 Million.

In 2008, Menlo Park provided the following core services, which have been identified as having an impact on greenhouse gas emission levels:

Table 8: City Services

Service / Facility		Service / Facility	
Water Treatment		Solid Waste Collection	X
Water Distribution	X	Landfill	X
Wastewater Treatment		Hospitals	
Wastewater Collection		Airport	
Electric Utility		Seaport / Shipping Terminal	
Fire Protection		Marina	
Police	X	Stadiums/Sports Venues	X
Mass Transit (buses)		Convention Center	
Mass Transit (light rail)		Street Lighting and Traffic Signals	X
Mass Transit (ferries)		Natural Gas Utility	
Schools (primary/secondary)		Other	X
Schools (colleges and universities)			

3.1.1 Emissions from Municipal Operations

Based on the City's Greenhouse Gas Inventory, for the base year of 2005, natural gas and electricity usage accounted for 50.8% on the GHG emissions from municipal operations. The inventory evaluated emission from several key contributors as summarized in the following table:

Table 9: Municipal Energy and Building Sector Overview

Electric and Natural Usage Category	CO_2e (metric tons)	Percent of Energy Sector Total
City Buildings	720	64.0%
Street Lights, Traffic Signals and Park Lighting	284	25.0%
Water and Storm Water Pump Stations and Irrigation Controllers	128	11.0%
Total	**1,132**	**100.0%**

The City has enacted numerous energy savings projects for its City Facilities and has plans for additional projects which are in various stages of development. The following table provides a summary of both energy conservation projects completed in the last five years and those planned for the near future.

Table 10: Completed Energy Conservation Projects Since 2003

City Facility	Action Taken
Main Library	Heating, ventilation, and air conditioning system retrofit with automated controls; Lighting upgrades from T12 to T8 fixtures – 1st floor only
Administration Building	Heating, ventilation, and air conditioning system retrofit with variable air volume dampers; Boiler replaced with high-efficiency two-stage boiler
Burgess Gymnasium and Gymnastics Center	Added insulation to ceilings
Corporation Yard	Lighting upgrades from T12 to T8 fixtures in offices and lunchroom
Onetta Harris Community Center and Gymnasium	Added roof insulation and "Cool Roof"
Burgess Pool	Solar heating system for pool water installed with pool replacement
Traffic Signals	Converted to LED lamps
Civic Center Fountain and Pond	Reduced run time

In 2008, the City joined PG&E's Climate Smart Program. By participating in the program, emissions from all gas and electric usage by municipal operations are offset through protecting forests that sequester carbon and capturing methane at dairy farms and landfills with greenhouse gas sequestration projects occurring elsewhere in California. While the City's electric and natural gas usage may be "offset" by participating in Climate Smart, the City should continue to look for opportunities to reduce energy use in its facilities through efficiency, conservation, and renewable energy.

3.1.2 Current Municipal Strategies

Table 11 summarizes several projects approved by the Menlo Park City Council for funding in the 2008/09 fiscal year.

Table 11: Energy Conservation Projects with Current Funding

City Facility	Planned Action
Burgess Recreation Center	Lighting retrofit based on audit performed by ABAG Energy Watch Program
Burgess Gymnasium	New building planned with photovoltaic system, solar domestic hot water heating system and other green building elements
Corporation Yard	Photovoltaic system - $100,000 budgeted Lighting retrofit based on audit performed by ABAG Energy Watch Program
Main Library	Lighting retrofit based on audit performed by ABAG Energy Watch Program
Sharon Heights Water Pump Station	Engineering design of replacement pump station with high efficiency pumps

Additional projects and programs under consideration for the City's fiscal year 2009/10 budget include developing grant funding for implementation of the Green Business Certification Program and for a City Climate and Energy Coordinator; funding to further develop and update this Climate Action Plan; a continuation of the Green@ Home program; and the development and implementation of a commercial recycling ordinance.

The City has several programs in place that support energy conservation and help to reduce greenhouse gas emissions. Examples include transit pass and carpooling programs, methane emissions mitigation at the closed Marsh Road Landfill (Bedwell Bayfront Park) and a variety of water conservation programs.

In upcoming years, there will be many new funding opportunities for local governments coming from the State as it carries out the mandates of AB32 and from the federal government as it begins to ramp-up its climate change mitigation efforts. One example of this is the California Energy Commission dedicating $26 million for low-interest municipal and public facilities loans for energy efficiency strategies. There is no minimum loan amount, and loans can cover up to

100% of the project up to $3 million per application. Loans have a fixed interest rate of 3.95%, a payback of 10 years, and must be repaid with cost savings within 15 years. The City of Menlo Park should look for State and federal funding opportunities to build upon the local initiatives.

3.2 Emission Reduction Strategies

Several proposed strategies are presented in this section. They include modifications to City facilities, expansion of existing City programs and implementation of new policies within City government. Table 12 below lists Municipal Operations strategies.

Table 12: Municipal Operations Strategies

Strategy Name	Status
Roofing for City Buildings - Reflective and Energy Star	Proposed
Solar PV Panels for Corporate Yard	Planned
Replace Existing Streetights with LED Models	Proposed
Sharon Heights Water Supply Pump Station Upgrades	Planned
Solar Heating for Belle Haven Pool	Proposed
Enhance Transit Pass/Carpooling Programs	Proposed
Marsh Road Landfill Methane Emissions Mitigation	Existing
Enhance Recycling Collection Services	Planned
Install Water Efficient Fixtures in Municipal Facilities	Planned
PG&E ClimateSmart	Existing
Climate and Energy Coordinator	Proposed
Plant Trees	Existing and Planned
Environmentally Preferable Purchasing Program	Proposed
Green Fleet Policy	Proposed
Idling Policy	Proposed

Roofing for City Buildings – Reflective and Energy STAR

Air conditioning is a close second to lighting for electricity use in most commercial/institutional buildings. A reflective roof can significantly reduce this use by reducing the heat entering the building through the roof. ENERGY STAR-certified reflective roof products reflect at least 65% of sunlight striking the roof, lowering roof temperatures by up to 100 ° F during mid-summer afternoons.

Reflective roofs save the most energy in hot, sunny climates. A reflective roof will only save energy on a building with air conditioning, although it will keep a non-air conditioned building cooler.

Reflective roofs cost about the same as traditional roofing products, so installing one during construction or when roof replacement is needed anyway involves no cost premium.

Reflective, or "cool," roofs function by increasing the amount of solar energy that is reflected off of a building, versus that which is absorbed. This reduces the temperature of the air inside of a building, and thus the energy required for cooling. By installing reflective roofing on a portion of the municipally owned buildings, the City could reduce electricity use and save money during the summer. One drawback to reflective roofs is that less energy from the sun is absorbed in the winter, resulting in increased heating costs if the building receives direct winter sunlight (resulting in sunlight being reflected rather than absorbed).

- Emissions Reduction Estimate - 8 metric tons CO_2e[1]
- Cost per Metric Ton of CO_2e Mitigated - $12,250
- Total Cost for Implementation - $90,000
- Payback Period - 3 years *(Payback based on cost estimate to replace of 60,000 square feet of existing roofing with reflective roofing.)*
- Implementation Timeframe – 2010 - 2015

[1] Energy reduction and implementation cost estimates are from the EPA Energy STAR roof calculator. Energy use was translated into GHG equivalent using the emission coefficient set from the Menlo Park 2005 GHG Emission Inventory report.

Solar Photovoltaic Panels for Corporation Yard

The City of Menlo Park has set aside $100,000 to install photovoltaic panels on the roof of the Corporation Yard buildings. By installing renewable energy generation capacity, the City will be reducing its reliance on grid electricity. The exact specifications of the solar photovoltaic system have not yet been designed. A conservative estimate would be the installation of a 20kW system, generating 36,000 kWh of electricity per year.

- Emissions Reduction Estimate – up to 15 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated - $333 *
- Total Cost for Implementation - $100,000

  Implementation cost estimate assumes $175,000 system cost with $75,000 in rebates and other incentives.

- Implementation Timeframe – 2009

Cost per metric ton calculated as Implementation Cost ÷ System Lifespan ÷ Emission Reduction Potential:

$$\frac{\$100{,}000/20 \text{ years}}{15 \text{ MT/year}} = \$333/\text{MT}$$

Replace Existing Streetlights with LED Models

LED streetlights are a highly efficient and practical way for local governments to reduce energy, energy costs, and greenhouse gas emissions associated with public lighting. Streetlights are often one of the largest items in the energy budget (up to 25% according to the California Energy Commission), and LED technology is constantly changing to improve LED options and feasibility. LED streetlights are solid-state devices rather than glass tubes with filaments, making them durable with a long life span which also reduces maintenance costs. LED streetlights have directional (white) light, making it clearer and easier for them to focus on roads and thus avoiding ambient light pollution and energy waste; they are also programmable and can be turned down when no one is around.

Menlo Park mainly uses High Pressure Sodium lamps, which are considered energy efficient and have a relatively long life span. However, replacing current streetlights with LED streetlights can have up to a 50% reduction in energy usage, and costs savings (including maintenance) can be up to 90%. According to CAPPA, replacing all of the streetlights along the downtown portion of Santa Cruz Avenue (approximately 59) with LED streetlights would save about 15,000 kWh of electricity and $1,500 in costs per year while reducing greenhouse gas emissions by approximately 3 metric tons of $C0_2e$ per year. This could be implemented as a pilot project to confirm installation costs and energy savings prior to considering a citywide replacement program.

Replacing every streetlight in the City of Menlo Park (approximately 2,000) with LED streetlights would save about 500,000 kWh of electricity and $50,000 in costs per year while reducing greenhouse gas emissions by approximately 350 metric tons of $C0_2e$ per year.

- Emissions Reduction Estimate – 118 metric tons
- Total Cost for Implementation - $1,600,000
- Payback Period - 32 years *(Payback based on $50,000 annual reduction in energy use)*
- Implementation Timeframe – 2015 - 2020

Other Cities with LED streetlight programs:

Ann Arbor, MI – Replacing 1,400 streetlights for a total cost savings of $100,000/yr and reduction of 265 metric tons of CO_2e
Toronto, ON – Installed LED streetlights at exhibition palace and plans to begin replacing 160,000 streetlights
Anchorage, AL – Expects to install LED streetlights to save the city $360,000/year

Sharon Heights Water Supply Pump Station Upgrades

The Menlo Park Municipal Water District (MPMWD) constructed the Sharon Heights Pump Station in 1962 to send potable water to a storage reservoir, the Stanford Linear Accelerator (SLAC), the Sharon Heights Golf and Country Club and the Sharon Heights neighborhood, now comprising approximately 1100 homes. The pump station is now nearing the end of its useful life due to the age of the system, and is proposed for replacement during FY 2009-10

The pump motors are only programmed for on/off configuration. Modern technology uses a variable frequency drive which allows the pump motors to start up and shut down slowly. This minimizes the need for a spike in energy to start up the motors and allows the pumps to more efficiently use electricity. The pump station also requires a backup power source.

In 2007, energy consumption by the existing pumps was 519,520 kWh based on PG&E billing records, costing the City $62,361. The replacement pump motors are expected to be 10-20% more efficient, representing a potential emissions reduction of 12 to 24 metric tons of carbon annually.

- Emissions Reduction Estimate – 12-24 metric tons CO_2e
- Total Cost for Implementation – $0 (Pump station needs to be replaced due to age of equipment, regardless of emissions reduction potential)
- Payback Period – N/A

  This analysis estimates a savings of $20,000 per year reduction in expenditures for grid electricity and operations and maintenance costs. The energy savings is secondary to the replacement of the pump station due to its age.
- Implementation Timeframe – 2010

Solar Heating for Belle Haven Pool

Solar pool heating is a simple and cost-effective application of solar energy. By substituting the sun for fossil fuels, pool water can be kept warm without producing GHG emissions. Solar heating can save on pool operations costs. It uses low-cost unglazed solar collectors. Pool water is circulated through the collectors by the pool's existing filtration pump. This allows a simple and inexpensive solar energy system that could pay for itself in energy savings in 16 years. Public swimming pools are high visibility locations for local governments to use solar energy and promote it to the public.

Cost and energy savings estimates were calculated based on US Department of Energy estimates for average design and construction costs on a square footage basis for swimming pools.

- Emissions Reduction Estimate – 19 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $1,875
- Total Cost for Implementation – $75,000
- Payback Period – 17 years (Payback based on $4,500 per year reduction in expenditures for natural gas for heating)
- Implementation Timeframe – 2010

Enhance Transit Pass/Carpooling Programs

The City of Menlo Park encourages the use of public transportation and other commute alternatives such as bicycling, car/vanpooling and walking through employee programs. The City initiated the Commuter Check and Transportation Allowance programs in 1992. The Commuter Check and Transportation Allowance programs are subsidy programs for those who take transit, bicycle, car/vanpool or walk to work. The Commuter Check is a special voucher used to purchase Bay Area transit tickets or pay for qualified vanpool costs. The City offers a $50 Commuter Check each month to all permanent employees. The Transportation Allowance is a subsidy of $1.50 a day for bicycling, car/vanpooling and walking to work.

To enhance and encourage more participation in the existing commute alternative programs, the following options and strategies may be considered:

- Increase the dollar amount of the Commuter Check subsidy and/or introduce the GO PASS (exclusive to Caltrain)
- Increase the dollar amount of the Transportation Allowance subsidy
- Establish a carpool matching webpage for employees

- Emissions Reduction Estimate – 22 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $2,300
- Total Cost for Implementation – $50,000
- Payback Period – N/A
- Implementation Timeframe – 2009

Marsh Road Landfill Methane Emissions Mitigation

Opportunities may be available to improve the rate of methane capture at Marsh Road Landfill in the short term while planning for future management scenarios after the facility is no longer producing power generation quality gas. As a closed landfill ages, the amount of methane that it releases gradually decreases as the organic material that it contains decomposes. Under a business-as-usual forecast scenario, it is projected that emissions at the Marsh Road Landfill will decrease from 41,748 metric tons of CO_2e in 2005 to 16,779 metric tons of CO_2e in 2020.[2] With existing technology, there is a low limit to the methane content of landfill gas, below which it is no longer economically viable to generate electricity from it. In 2005, the methane content of the gas at Marsh Road Landfill fluctuated between 41.5 percent and 57 percent methane throughout the year. In the upcoming years, the City should stay abreast of new developments in landfill gas capture technology, so that as the methane content and total flow of the gas being emitted from the landfill decreases, the best options for methane capture are considered.

- Emissions Reduction Estimate – 25,000 metric tons CO_2e by 2020
- Cost per Metric Ton of CO_2e Mitigated – $0 without additional upgrades
- Total Cost for Implementation – $0
- Payback Period – N/A
- Implementation Timeframe – 2009 (On-Going)

[2] Subsequent to the completion of February 2008 Update to the Menlo Park Emission Inventory Report, a data entry error was discovered that resulted in an over-estimate of future GHG emissions that will occur from the escape of fugitive emissions from the Marsh Road Landfill. The revised emission forecasts for the Landfill show that emissions will probably decline more quickly than was indicated in the Emissions Inventory Report.

Enhance Recycling Collection Services - 2011

City facilities will receive enhanced recycling and garbage collection services beginning in 2011. Single stream recyclables (mixed bottles, cans, paper, plastic) will be collected from City buildings, parks, streets and parking lots. City-generated organic materials will also be collected and transported to a composting facility. Cell phones and batteries will be regularly collected. Outdoor public event recycling will be provided, including placement and servicing of individual containers for single stream recyclables and organics including food waste.

Single stream recycling is expected to increase diversion of City-generated bottles, cans, paper and plastic by about 15 percent. If food waste and other compostable materials are included in the service, there could be another 15 percent increase in tonnage diverted from the landfill, and the amount of waste landfilled should decrease correspondingly. Recyclables and organic materials diverted from Ox Mountain Landfill will extend the life of the landfill, saving significant transportation and landfill fee increases which will be necessary when the landfill ultimately closes (estimated to occur in 2024).

Waste materials landfilled emit methane gas as they decompose - a global warming pollutant 24 times as dangerous as CO_2. Decreasing landfilled material by 15 percent would result in a reduction of 357 metric tons of CO_2e[3]. Single stream recycling also supports conservation of resources and produces substantial benefits of providing compost and other soil amendments, and improved customer convenience with single stream recycling services.

- Emissions Reduction Estimate – 357 metric tons CO_2e by 2020
- Cost per Metric Ton of CO_2e Mitigated – *TBD*
- Total Cost for Implementation – No direct costs to City[4]
- Payback Period – N/A
- Implementation Timeframe – 2011

[3] The emissions reduction number was calculated using the EPA's WARM model. An emission factor set was used that does not account for sequestration of carbon in landfills, but does include avoided emissions due to upstream energy use avoiding as result of recycling versus using virgin materials for making products.

[4] Costs for collection of City generated recyclables and garbage are spread throughout the garbage rates paid by all residential and commercial customers. The cost of collection services is expected to increase by 15%.

Install Water Efficient Fixtures in Municipal Facilities

Reducing the volume of water transported through pipelines and treated at a wastewater treatment plant saves energy and reduces emissions. Reducing the use of hot water saves even more energy. Emissions reductions are not specified for this strategy because the impact is expected to be relatively small. Energy savings will be realized in the overall reduction in energy use reported by PG&E in the future.

The City owns 14 buildings and could replace all its existing plumbing fixtures with water efficient fixtures including replacement of hot water heaters with tankless ("on-demand") heaters, low flow toilets and urinals, automatic hand washing faucets, etc. By bringing existing plumbing fixtures up to current standards, a reduction in both water and energy consumption will result. For example, replacing existing toilets with high efficiency toilets (HET's) could save up to 5 gallons per flush.

Implementation could be phased in over the course of several years as building modifications or repairs are conducted, or could be accomplished as one large project.

- Emissions Reduction Estimate – Minor
- Total Cost for Implementation – $50,000
- Cost per Metric Ton of CO_2e Mitigated – $3,000 - $50,000
- Payback Period - 25 years *(Payback based on $2,000 per year reduction in expenditures for water and for grid electricity to heat water.)*
- Implementation Timeframe – 2010

PG&E ClimateSmart

ClimateSmart is a carbon dioxide offset program that allows PG&E customers to pay a monthly fee that is used to fund greenhouse gas reduction projects that are certified by the California Climate Action Registry (CCAR). CCAR protocols include forestry-based carbon sequestration and livestock manure management projects.

The City began purchasing offset credit for Greenhouse Gas Emissions through Pacific Gas and Electric's (PG&E) ClimateSmart Program in April 2008. There are benefits to participation in ClimateSmart or other sequestration programs, and Menlo Park may wish to continue this investment in the future as part of its overall carbon footprint reduction program.

- Emissions Reduction Estimate – None (720 metric tons CO_2e offset)
- Cost per Metric Ton of CO_2e Offset – $15/year
- Total Cost for Implementation – $9,000 per year (varies)
- Payback Period – N/A
- Implementation Timeframe – 2009 (On-Going)

Climate and Energy Coordinator

A number of local governments throughout California have identified limited staff time and limited financial resources as primary obstacles to achieving their climate and energy goals. All too often, local governments pour significant resources into formulating an emissions inventory, setting an emission-reduction target and drafting a climate action plan, without building the organizational structure needed to capitalize on these investments.

In response to this challenge, an increasing amount of local governments have begun to form staff positions devoted to coordinating climate matters – both within government operations and throughout the community. In many cases, a coordinator will oversee the development of an emissions inventory and climate action plan, however, their most crucial role is to ensure efficient and effective implementation of climate and energy projects and policies.

The City of Menlo Park should hire a Climate and Energy Coordinator to lead implementation of the climate action plan, and manage the City's climate and energy efforts over time. It is likely that significant federal, State, and private-sector resources will be offered to support local government climate action in the next few years; having a devoted staff person will best position Menlo Park to take advantage of these opportunities. Menlo Park should consult neighboring cities of Morgan Hill, Santa Cruz, Berkeley, and San Francisco (as well as others) to learn more about successful Climate and Energy Coordinator models.

Primary responsibilities of the Climate and Energy Coordinator could include overseeing the implementation and refinement of the climate action plan; research various technologies, infrastructures, strategies and vendors to achieve goals; develop project budgets and work plans to achieve implementation of the climate action plan; manage the economic aspects of implementation, including grant-writing and project financing; ensure ongoing funding of the Climate and Energy Coordinator position; develop and oversee various contracts to implement City projects and programs; work with interdepartmental staff and teams to reduce GHG emissions from City operations, including the creation and delivery of staff education programs; forge alliances with neighboring public agencies to bolster economies of scale and regional collaboration; lead community outreach and education, and implement programs to assist residents and the business community in reducing emissions and improving sustainability;

develop and maintain relationships with regional, State and federal agencies involved in climate, energy and sustainability fields; serve as an internal expert on energy and sustainability technologies and policies; represent the City at regional meetings, conferences and workshops; prepare plans, reports, memos and other materials to communicate program strategies and results to City Council, committees and the community; manage GHG tracking, including: the update if the greenhouse gas emissions inventory, the coordination of climate program participation (e.g. CCAR, TCR, CCX), and the development and implementation of internal tracking systems to ensure protocol-compliant and streamlined data analysis; monitor progress on action plan implementation, and conduct policy analysis and project development to refine the climate action plan over time; research, analyze and report technical information on programs implemented elsewhere to improve program offerings; and work with other staff members for long-term program and strategic planning efforts.

Efforts should be made to ensure perennial continuity of the Climate and Energy Coordinator position. The Coordinator could be encouraged to generate a portion of his/her own salary through cost reductions associated with municipal energy savings, and through strategic grant-writing. First-year funding for such positions has historically been provided to Bay Area local governments through the Bay Area Air Quality Management District (BAAQMD) Climate Protection Grant Program.[5]

The City of Menlo Park may also want to consider the Coordinator's scale of engagement across a time trajectory. For example, the City may choose to implement a 0.5 FTE position for the first year, with plans to build a full-time position in year two. The City should also prioritize areas of focus for the Coordinator across a time trajectory, ensuring maximization of resources and a successful strategy for building capacity over time.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – $150,000
- Payback Period – Unknown

[5] Continuity of this grant program is uncertain.

Plant Trees

Urban forests provide multiple economic and environmental benefits to the community. As humans continue to emit billions of tons of CO_2 and other greenhouse gases into the atmosphere each year, trees actively remove CO_2 from the air through photosynthesis and store the carbon in their physical structure (i.e. roots, trunk, branches, leaves). Furthermore, properly planted trees alleviate the urban heat island effect by reflecting sunlight and providing shade for buildings; resulting in reduced energy usage for heating and, primarily, cooling buildings.

The average mature tree can absorb as much as 48 lbs of CO_2 per year[6]. Based on Menlo Park's tree inventory conducted in 2003, the city's urban forest absorbs 470 metric tons of CO_2 yearly. However, this is a general estimate. In order to calculate a more accurate reduction, each tree's species, diameter at base height (dbh), and height should be entered into STRATUM[7] to obtain a final total. If Menlo Park wishes to further calculate the carbon reduction and storage potential of planned trees, the CCAR equation is able to provide such data. For example, the carbon dioxide sequestration potential over the lifetime of an American Sweetgum (Liquidambar styraciflua), the most prevalent Heritage tree species found in Menlo Park, was determined to be 2.476 metric tons. Calculating the carbon storage potential for each species in Menlo Park will give city planners a better idea of which trees to plant in order to sequester the most CO_2.[8]

The City of Menlo Park has implemented a Heritage Tree Program and Street Tree Reforestation Project, keeps a professional arborist on staff and provides street tree trimming and tree management support to the community. The City's Environmental Quality Commission is highly active in promoting a sustainable urban forest. Tree planting is highly encouraged, along with selective replacement of declining trees. Continuing and potentially expanding on these efforts will be important not only to the City's "Tree City USA" culture, but also in reducing energy consumption for cooling during the summer and for sequestering carbon throughout the City.

[6] ICLEI. Talking Trees: An Urban Forestry Toolkit for Local Governments. (November 2006)
[7] STRATUM is a street tree management and analysis tool for urban forest management.
[8] See Appendices for more detailed calculations.

The City should also calculate the economic and environmental benefits of the city's urban forest. By using the Street Tree Resource Analysis Tool for Urban Forest Management (STRATUM) software[9], the city will be able to quantify the dollar value of annual environmental and aesthetic benefits: energy conservation, air quality improvement, CO_2 reduction, stormwater control, and property value increase[10]. Once the CO_2 reductions have been calculated, the City of Menlo Park can apply them towards their greenhouse gas reduction goals or register them with the Climate Action Reserve if they wish to sell them in a national voluntary carbon reduction market. However, in order to register with the Reserve, the city must first become a member of the California Climate Action Registry (CCAR) and follow the Urban Forest Project Reporting Protocol guidelines. Even if Menlo Park chooses to not register its Heritage Tree program with CCAR, there are numerous benefits to quantifying the annual greenhouse gas flux from its trees.

As an ongoing strategy, the City should set a goal of planting 100 new trees per year.

- Emissions Reduction Estimate – 2 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $7,500 per metric ton
- Total Cost for Implementation – $15,000 per year
- Payback Period – Unknown
- Implementation Timeframe – 2009 (On-Going)

Energy savings for the City's facilities and residents combined could currently be as high as $1.5 million.

The City of Fort Collins, CO has one of the most comprehensive and well respected urban forestry programs in the United States. Based on a study conducted by the Center for Urban Forest Research, it was concluded that the net annual benefit of Fort Collins' urban forest equaled $1.17 million.

[9] Provided free of cost by i-Tree (http://www.itreetools.org/stratum.shtm)
[10] *Street Tree Populations- STRATUM*. (2006)
http://www.itreetools.org/street_trees/introduction_step1.shtm

Environmentally Preferable Purchasing Program

"Green procurement" or "environmentally preferable purchasing" (EPP) policies and programs can create wide reaching benefits, including reduced material consumption, energy requirements, waste, air pollutants and greenhouse gas emissions, as well as improved comfort, health and safety for product users. A number of criteria are often applied under the umbrella of a green procurement policy toward advancing these objectives, and these criteria can serve as an important screen for any new procurement decision, helping to put Menlo Park's green priorities into action.

While greenhouse gas emissions impact is often just one of the criteria applied under a green procurement policy, the inclusion of this criterion provides a new opportunity to ensure that GHG impacts are considered when procurement decisions are made. Ideally, both near term and full lifecycle GHG impacts will be considered, though in some cases these impacts can only be roughly estimated.

An EPP program is likely to result in a reduction in the amount of materials used and purchased. However, the amount of resources that will be saved is limited by the scale of the City's operations and purchasing. Because some replacement materials will be more expensive than those currently being used, the implementation of an EPP policy may result in a small increase in annual purchasing costs.

The City should develop and implement an EPP policy that focuses on reducing the amount of waste the City sends to landfills and reduces the energy use associated with purchases.

Emission reduction and implementation costs will vary depending on the types and quantities of purchases.

King County, WA – In 1989, King County adopted its original recycled product procurement policy in response to overburdened landfills and the need to create markets for newly collected recyclables. Today, the King County Environmental Purchasing Program provides County personnel with information and technical assistance to help them identify and evaluate and ultimately purchase economical and effective environmentally preferable products and services. In the past year, King County agencies purchased $36 Million worth of these products, saving $640,000 compared to the cost of conventional products.

- Emissions Reduction Estimate – 1 - 100 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $10 - $10,000 per metric ton
- Total Cost for Implementation – $10,000 + ¼ FTE ongoing
- Payback Period – Variable
- Implementation Timeframe – 2010

3.3 Emission Reduction Strategies Requiring Further Analysis

The following strategies will need further research on cost, payback, and/or emission reduction quantification.

Green Fleet Policy

Within Menlo Park's municipal operations, the vehicle fleet is responsible for the second largest share of the city's overall emissions[11]. Improving the fleet's fuel efficiency can result in long-term energy savings and greenhouse gas reductions. By implementing a green fleet and idling policy, Menlo Park will be able to reduce its fuel consumption, cut operation costs, and reduce pollutants. This Green fleet policy should include:

- Retiring fuel inefficient vehicles
- Optimizing vehicle type (efficiency, size),
- Using alternative fuels
- Providing and encouraging the use of alternative modes of transportation
- Purchasing environmentally responsible consumables (recycled anti-freeze, retread tires)
- Preventive vehicle maintenance (proper tire inflation, avoided oil leaks).

Idling Policy

Reducing idling from fleet vehicles conserves fuel, extends the life of the vehicles and is a benefit to the environment. Ideally, an idling reduction policy should contain the following components:

- Cover all vehicles operated by the municipality
- State an acceptable maximum allowable idle time (0 – 5 minutes)
- Include provisions for extreme weather.
- Include provisions for vehicles with specialized equipment, such as emergency vehicles.

[11] Greenhouse gas emissions analysis conducted in 2007

- Have an effective and efficient way to measure the policy's effectiveness.
- Provide a means of informing employees of the policy's requirements and effectiveness.

In addition, a public awareness campaign to educate citizen and convene them to act on idling issues could be established. The focus could be though an educational program at schools and parents and other locations where people or goods are picked up or dropped off.

Section Four: Community Strategies

Community Strategies

4.1 Overview

Approximately 2.4 billion metric tons of greenhouse gas emissions were attributed to the generation of electricity in the United States in the year 2006.[12] Electric power sector emissions considered as a whole—rather than attributed to other carbon producing sectors that use electricity—represent the largest source of energy-related carbon emissions. Including other sources of emissions, such as the use of natural gas for heating, cooking, etc., the commercial and residential sectors both produced approximately 1.2 billion metric tons of greenhouse gases in 2006—together equaling total emissions from electricity generation for all sectors.[13] Residential and commercial energy consumption is intimately linked to the types of buildings and facilities that we build, to the technologies that we use, and to our behaviors as inhabitants of this infrastructure.

The State of California began addressing the conservation of electricity in 1978 through the California Energy Code. The California Energy Code establishes minimum standards for building components such as efficiencies of environmental heating and cooling equipment, building insulation and fenestration to reduce the amount of environmental heating and cooling, and high efficiency lighting. The most current edition of the California Energy Code was revised and published in 2005 and is considered the most stringent in the United States. The City of

[12] Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 –2006, ES-16; http://www.epa.gov/climatechange/emissions/downloads/08_ES.pdf
[13] Ibid.

Menlo Park adopted the 2007 California Energy Code, which is a republication of the 2005 edition, in November 2007 as part of the Building Codes adoption process.

On July 17, 2008, the State of California Building Standards Commission adopted a State Green Building Code. Although the Green Building Code will only be voluntary when it initially takes effect, its statewide application is significant. The voluntary nature of the regulations is likely to be short-lived – at least some elements of the Green Building Code are expected to become mandatory by the end of 2010. The purpose of the Green Building Code is to enhance "the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices." It focuses on improving five key areas of building design and construction: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) environmental air quality.

Implementation of the Green Building Code will likely reduce the impact that the construction and operation of buildings have on energy related carbon emissions, which will in turn facilitate the State's efforts under AB 32 to reduce greenhouse gas emissions to 1990 levels by 2020. The Code aims to cut energy use in buildings by 15% to 30%, reduce potable water use by 20% and water for landscaping by 50%.

4.1.1 Greenhouse Gas Emissions in Menlo Park

Greenhouse gas emissions from electricity and natural gas use in Menlo Park account for nearly half of the total community-wide emissions. As stated in the City's 2005 Greenhouse Gas Emissions Analysis report, electricity use in Menlo Park produced an estimated 104,164 metric tons of greenhouse gases (21.2 %) and natural gas use produced 101,589 metric tons of emissions (20.7%).[14]

The inventory report also provides data on the emissions from residential sources vs. commercial/industrial sources. This analysis was based on PG&E records and includes only an estimate of electricity purchased through direct access agreements where customers

[14] 2005 emissions analysis of electricity and natural gas use in Menlo Park pertains to end-use in the residential, commercial, and industrial sectors. See *City of Menlo Park Greenhouse Gas Emissions Analysis* for more detail.

purchase energy directly from a supplier other than PG&E.[15] Based on the inventory report, 2005 residential PG&E gas and electricity usage accounted for 11.4% of total community-wide emissions, commercial and industrial PG&E usage accounted for 24.1% of total emissions, and direct access customers accounted for 6.0%.

4.2 Current City of Menlo Park Strategies

The City has already implemented strategies to encourage sustainable building practices and reduce energy consumption in buildings. These strategies have the potential to reduce greenhouse gas emissions over time, once the respective programs have been in effect for several years. The following list, while not all inclusive, is intended to identify several of the programs that are in progress:

Green Building Display – The City continues to provide a green building display where residents and businesses can learn about green building materials. The display allows interested parties to see green building materials firsthand and to learn about materials that can be incorporated into local building projects.

Library Environmental Awareness Collection – The City's 2008-09 budget included $8,000 to supplement the City's collection of print, media and on-line resources within its two libraries.

Implementation of Green @ Home Program – The City's 2008-09 budget included $37,000 to implement an in-home energy and water audit program. The City's goal is to reach at least 250 households in 2008-09 with the program.

Elimination of Solar Permit Fees – In November 2007, the City eliminated all building permit fees related to the installation of photovoltaic systems installed in Menlo Park, as an incentive for property owners to install solar electricity generating capacity on their homes and businesses.

[15] Direct access estimates are based upon county level data provided by the California Energy Commission. See *City of Menlo Park Greenhouse Gas Emissions Analysis* for more detail.

Climate Change Impact Documents – Staff is requiring that potential climate impacts be addressed in environmental documents for proposed major land use projects. The consultants assisting staff in the review of these documents have expertise in the area of climate change.

Building Code Exemptions for Green Building Techniques – Staff has approved the proposed use of green building techniques and materials in development projects that are not specifically prescribed in the Building Codes, but meet the intent of the codes. An example of an approved design is unventilated attics, which reduce air leakage and heat loss. While the 2007 California Building Code requires attic spaces to be ventilated, several unventilated attics have been approved as an alternate method for saving on heating costs.

Implementation of Green Building Check Lists – Funding was included in the City's 2008-09 budget to develop a phased system of green building checklists. The phases are: (1) voluntary submittal of LEED checklists for new non-residential projects over 10,000 square feet—began in July 2008; (2) voluntary submittal of appropriate checklists of all new residential projects of more than 5 units and mixed use projects—began in October 2008; (3) mandatory submittal of appropriate checklists for all project types identified in phases 1 and 2—beginning January 2009; and (4) staff analysis of a required certification program for Council consideration of, and direction on, a mandatory program as a part of its project priority—consideration for 2009-2010. As part of the phased approach for proposed development projects, City Council also has approved money in the current fiscal year budget for the training of staff in green building practices.

Transportation - The City of Menlo Park has been creating and implementing programs to mitigate traffic congestion and air pollution since 1989. The City has been a leader in a number of different areas:

- CalTrain Shuttle Program (launched in 1989)
- Midday Shuttle Service (started in 1992)
- Door-to-Door Shopper's Shuttle Service for Seniors
- Alternative Commute Program for City Employees

- Development Fees on New Commercial Developments (to help fund the shuttle program)
- Transportation Demand Management (TDM) Strategies for New Commercial Developments
- Employer Assistance TDM Programs
- Mid-Peninsula Summit on Sub-Regional Transportation Issues (to enhance coordination among transit agencies in Palo Alto, East Palo Alto, Menlo Park and Stanford)
- The City of Menlo Park was the first city along the Peninsula to launch a shuttle program connecting Caltrain riders to their worksites in Menlo Park. This program was launched in 1989. Many of Menlo Park's employment centers are served by the City's peak hour Caltrain shuttle service which operates from 7 a.m. – 9:30 a.m. and 2:30 p.m. – 6:30 p.m. In 2007 the shuttles accommodated 47,534 passengers.
- The Midday shuttle bus is a free community shuttle which operates from 9:30 a.m. to 3:30 p.m. The Midday shuttle stops at several senior housing facilities and travels to key destinations such as downtown Menlo Park, the library, the Menlo Park senior center, Little House, Safeway, Stanford Shopping Center. The Midday shuttle service carried 20,667 passengers in 2007.
- The Wednesday Shopper's shuttle serves those who do not live close to the Midday shuttle route or other public transportation stops. The shuttle stops at several key destinations including downtown Menlo Park, Little House, the library, Safeway and Stanford Shopping Center.
- The City encourages employees to use alternatives to the single occupancy vehicle by subsidizing the cost of their work commutes. Employees who take transit receive a $50 Commuter Check each month. Those who bike, walk and carpool to work receive a $1.50 a day for their effort. The City has installed bike lockers and bike racks around its campus to encourage employees to bike to work. Showers and lockers are also available to employees.
- New commercial developments in Menlo Park support the shuttle program with an annual fee based on the square footage of building space. In addition, those proposing new

commercial developments may choose from a list of TDM strategies which they consider most appropriate for the type of business and development being proposed.

- The City works with new employers to establish Transportation Demand Management programs that will assist employees in finding ways to get to work other than by single-occupant vehicle. These programs include a variety of options ranging from an Emergency Ride Home program, to Try Transit incentive kits, to on-site Transportation Fairs, and shuttle programs.

- The City educates residents, employees and visitors about commute options through yearly events and programs such as Bike to Work Day, Spare the Air campaign, Try Transit week, transportation fairs and block parties. The City distributes commute alternative information to its residents and employers/employees through targeted mailings and postings of commute alternative information on the City's website.

- The City has also completed several "Safe Routes to Schools" projects to encourage children to walk and bike to school. The City implemented improvements to areas surrounding the Oak Knoll Elementary school to facilitate a better environment for walking and biking. These strategies included parking restrictions, enhanced crosswalks, vehicle turning movement restrictions, etc. The City also received a grant from the Federal Government to implement in-pavement lighted crosswalks on Santa Cruz Avenue for Hillview Middle School. The City finished a study of Laurel Elementary school last year and received a grant to fund the construction of the project. Finally, during the summer/fall 2008 a "Safe Routes to School" study is being conducted of the Encinal Elementary school.

- The City is also conducting a study to create a toolbox of Alternative Modes to School. The Study will work with two pilot schools to implement programs to reduce vehicle trips to the school. Some of the tools may include carpooling, better sidewalks, crossing guards, etc. After working with the pilot schools, the study will produce a toolbox of various alternatives, including implementation guidance and cost estimates. The City will work with other schools in the City to help them implement some of the tools to reduce vehicle trips.

Recycling Programs

The City will continue to promote and assist commercial and residential customers with recycling and waste reduction programs, coordinating with the current contractor Allied Waste/Republic Services. An extra effort will be initiated to inform residents and businesses that recycling containers are available at no extra charge. An ongoing effort will be made to inform residents that extra plant materials carts are available for a small fee. Paper/cardboard recycling bins will continue to be available to businesses and residents in the downtown parking lots. The City will also sponsor and promote electronics recycling drop-off events and household hazardous waste drop-off events at least three times per year. Recycling containers will continue to be provided in parks, along busy streets, throughout City facilities, and at public events. The City will continue to enforce its Construction and Demolition Recycling Ordinance requiring at least 60 percent of materials from certain projects to be salvaged or recycled.

Menlo Park Municipal Water District Water Conservation Programs

The City offers a number of free services and giveaways to customers of the Menlo Park Municipal Water District (MPMWD) to assist them with water conservation in homes, businesses and commercial facilities. The MPMWD serves approximately 10,000 of the City's residents, with the remainder served by California Water Service Company ("Cal Water"). The MPMWD and Cal Water are working together to deliver a consistent water conservation message within the City.

The State declared a drought during water year 2008, and it is anticipated that 2009 may be equally dry. Water conservation will be absolutely necessary during dry years. Strategies that can reduce water consumption and waste during dry years are important during normal years as treatment, pumping and wastewater treatment

The City continues to look for ways to improve and expand its existing programs while retaining the quality of service its residents and visitors have come to expect. With soaring gas prices and a growing concern for reducing our carbon footprint, it is important to continue our efforts and add to the number of programs that will satisfy a much bigger demand than ever before for local and regional commute options.

4.3 Emissions Reduction Strategies

Several proposed strategies are presented in this section. They include modifications to City facilities, expansion of existing City programs and implementation of new policies within City government. Table 13 lists Community Strategies described in this section.

Table 13: Community Strategies

Measure Name	Status
Residential Energy Audit Program (Green@Home)	Existing
Energy Efficiency and Renewable Energy Financing Program	Proposed
Electric and Plug-in Hybrid Vehicle Charging Stations	Proposed
Expand Community Shuttle Service	Planned
Implement Bike Improvements	Planned
Enhance Recycling Collection Services	Planned
Incentives for Building Practices that Reduce Energy Consumption Beyond Current Codes	Proposed
Early Implementation of CA Green Building Code Standards	Proposed
City Car Sharing Program	Proposed
Limit Commercial Vehicle Idling	Proposed
Transportation Demand Management Strategies	Existing and Proposed
Resident Education on Trip Reduction	Existing and Proposed
Transportation Management Associations	Proposed
Zero Waste Plan and Target	Proposed
Requiring Recycling Service for Commercial Facilities	Proposed
Construction & Demolition Debris Ordinance Update	Proposed
Menlo Park Municipal Water District Conservation Programs	Existing
Landscape Ordinance Update	Planned

Residential Energy Audit Program (Green@Home Menlo Park Program)

The Green@Home program recruits volunteers from Menlo Park neighborhoods and other nearby communities to perform simple energy-saving retrofits and provide free home energy audits to Menlo Park residents. Each volunteer receives 6-7 hours of free training by Green@Home on how to install some energy conserving devices, as well as how to perform a basic household energy audit before meeting with residents.

The Green@Home program offers services to residents at no cost. During household energy audits, volunteers look for ways that residents can save on their utility bills. With resident permission, the volunteers are trained to carry out the following energy efficiency upgrades:

- Install a retractable clothesline
- Test for appropriate hot water and refrigerator temperatures
- Install faucet flow restrictors
- Install a low flow showerhead
- Teach the resident how to pump up their car tires

In addition, volunteers provide residents with a personalized Home Energy Savings Plan that lists the upgrades that have been made and makes energy-saving suggestions that the resident can implement on their own. To encourage residents to follow-through on implementing energy saving changes on their own, phone calls are made to the residents two months after the house visit.

Green@Home is a community awareness program. Social science research has found that people are more likely to adopt environmentally positive behaviors when they perceive that others are doing so, too. Green@Home distributes colorful lawn signs that say, “We’re saving energy – and money, too!” to all residents who receive a visit by a volunteer, inviting others to participate.

The Green@Home program has estimated the home energy savings and accompanying CO2 reductions for 8 energy upgrades that they perform and over 80 additional energy savings upgrades/energy-saving habits that the resident can implement on their own.

The program's goal is to visit 250 homes in Menlo Park and reduce CO_2e by a minimum of 1,000 lbs per residence for a total of 250,000 pounds of CO_2e or 113 metric tons CO_2e per year.

- Emissions Reduction Estimate – 113 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $265
- Total Cost for Implementation – 50 hours + $37,000 (first year program cost)
- Payback Period – N/A (Note: Each participating household will save approximately $230.)
- Implementation Timeframe – 2009 (On-Going)

In Spring 2007, Green@Home was designed as a pilot project for two Palo Alto neighborhoods (Barron Park and Midtown). The project trained 37 volunteers, served approximately 40 homeowners and saved an estimated yearly total of 14 to 40 metric tons of CO2. Based on these experiences, Green@Home has been developed and expanded to other communities, including Menlo Park.

Energy Efficiency and Renewable Energy Financing Program

Until recently, there were two main hurdles to solar and energy efficiency installation that State and federal subsidies did not address: high up-front costs, and the possibility that those costs would not be recovered if the property were sold. The passage of AB 811 in July 2008 eliminated these barriers by utilizing the same energy financing mechanism used in Berkeley, in which the City serves as the financing agent through a low-interest loan program. Individual property owners (residential and small businesses) contract directly with qualified private installers and contractors for energy efficiency and solar projects. The City provides funding for the project by partnering with a utility or from a bond or loan fund that it repays through assessments on participating property owners' annual tax bills over a 20-year period. Under this plan, there is little or no up-front cost to the property owner, and if the property owner sells the property prior to the end of the repayment period, the new owner takes over the assessment payments which continue on the property's annual tax bill. AB 811 allows general law cities (such as Menlo Park) to take advantage of this bill along with charter cities that traditionally have more municipal authority.

The City of Menlo Park could create a City-run, low-interest energy financing program to fund energy efficiency and clean energy. While AB 811 does not specify how to implement the program, Menlo Park can draw upon the work of cities as examples. The loans could fund anything that is a permanent fixture on the property that would reduce electricity and natural gas consumption, including energy efficient air-conditioning, lighting systems, pool pumps, refrigerators, and installation of solar panels, reflective roofs, or insulation.

The table below lists a few strategies that would qualify under AB 811, with their estimated potential greenhouse gas (GHG) reductions and cost savings for households.

Table 14: Proposed Energy Efficiency and Renewable Energy Strategies

Strategies	Estimated Percent of Avg. Household's GHG Reduced [1]	Metric tons of GHGs eliminated each year [1]	Estimated Household Cost Savings
Install a solar photovoltaic system	15-40%	0.6-1.6	$500/year[4]
Install a solar hot water system	10-15%	0.4-0.6	$200/year[3]
Replace old single-pane windows with dual-pane windows	10%	0.4	20% heating and cooling, up to 10% total energy costs[2]
Upgrade attic insulation to 12 inches	5%	0.2	20% heating and cooling, up to 10% total energy costs[2]
Replace refrigerator with a new ENERGY STAR model	2%	0.1	Up to $80/year[2]
Total	**42%**	**1.7**	**$800**

1 Percentages and other numerical values are from Berkeley's Climate Action Plan. Approximations are based off of national and local averages and are rough estimates. GHG reduction estimates were converted from pounds to metric tons.

2 ENERGY STAR, based on national household energy and cost averages.

3 Estimated from CAPPA, based on national household energy and cost averages for one average home solar hot water system.

4 Estimated from CAPPA, based on national household energy and cost averages for one average 3kW solar system.

A pilot program could be funded by using General Fund and Redevelopment Agency reserves. As a low interest loan program, the costs of the program could be minimized by setting interest rates the same as the City currently receives from its investment portfolio. The City currently invests significant portions of its reserves in the Local Agency Investment Fund, which currently has yields around 2.5%. Offering loans at this rate would be a very attractive incentive for homeowners to make energy efficiency improvements. In theory, the cost of the program would be limited to staff administration costs if loan interest rates were set to equal our investment earnings rate. However, there would be some risk that as interest rates changed in the future the

> ***Palm Desert*** plans to provide loans with a 7 percent interest rate for as little as $5,000 with no upper limit and hopes that this will help alleviate $1,000/month energy bills and solar panel systems that cost an average of $20,000 and last around 40 years.
> The City of Berkeley is raising $1.5 million to start a pilot program in fall of 2008 for 50 homes, probably totaling around $22,000 per home; homeowners are expected to pay roughly $180 more on property tax bills but will recoup some of this money in energy cost savings. Menlo Park should strive to implement a similar program.

interest rates set for the program would be below future market conditions. The loss of liquidity of funds invested in a low interest loan program would also be a potentially negative side affect of the program.

If a pilot program were developed with $2 million of initial capital, and the average loan amount was $22,000 (as estimated in the Berkeley program) then 91 retrofits could be performed. As loans were paid back, the principal could be reinvested in the program allowing additional retrofits to occur in the future. Interest payments received under the program would be returned to the original funding source as investment earnings. The design and startup time for implementing an energy financing program would take 12 to 18 months.

- Emissions Reduction Estimate – 232 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $485
- Total Cost for Implementation - $75,000 cost to City to design program, additional annual cost to administer program (will vary depending on participation)
- Payback Period – 20 years for loan repayment
- Implementation Timeframe – 2009 - 2012

Electric & Plug-In Hyrid Vehicle Recharging Stations

As more fuel efficient vehicles become available, including electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and vehicles that can use lower carbon content fuels, such as biodiesel derived from waste vegetable oil, the City of Menlo Park can do its part to make it easier for drivers to own and use them in the community. By 2010 several major car manufacturers have indicated that they will be selling EVs and PHEVs in the United States. The City can encourage their adoption by providing residents and visitors with the infrastructure needed to recharge their EVs and PHEVs in-town. One of the simplest ways to do this is to construct vehicle recharging stations in public parking facilities, encourage larger local businesses to install recharging stations, and encourage contractors and developers to incorporate recharging facilities into multi-unit housing projects.

The Cities of San Francisco, Oakland, and San Jose recently announced a partnership with Better Place, Inc. to build a network of recharging stations and battery exchange stations throughout the Bay Area with the goal of creating the infrastructure needed to support 1 million battery powered cars by 2015. Better Place is attempting to raise $1 billion to fund the construction of the charging and exchange stations. Pilot studies of recharging stations are already underway in several Bay Area cities, including San Jose.

The emissions reductions associated with EVs and PHEVs is a result of drivers switching to 100% or mostly battery powered vehicles from vehicles that rely mostly on gasoline and diesel combustion for their power. For the sake of simplicity, it is assumed that of the barrier to getting people to use EVs and PHEVs is availability and pricing, while is the necessary infrastructure to support the vehicles that need recharging—namely charging stations. There will be several opportunities for the City of Menlo Park to become involved in the effort to create a Bay Area vehicle recharging network:

- For its own vehicle fleet, the City could install a battery recharging station as a pilot of the Coulomb Technologies system, or another company's system. One or several neighborhood electric vehicles could be purchased or leased to test in conjunction with the charging station.

- In 2010, timed to correspond with the introduction of the first wave of mass marketed EVs and PHEVs onto the roads, the City of Menlo Park could begin building vehicle charging stations in

public parking areas and perhaps offer incentives to businesses and multifamily housing unit owners and developers to install recharging stations. Incentives could include streamlined permit processing, fee discounts or design templates. Recharging stations could be phased in over the next five years.

- Emissions Reduction Estimate – 7,000 metric tons CO_2e
- Cost per Metric Ton of CO_2e Mitigated – $7 (not including cost of power to station)
- Total Cost for Implementation – $45,000 for 30 recharging stations ($1,000 to $2,000 per charging station)
- Payback Period – N/A
- Implementation Timeframe – 2012 – 2015

San Jose, CA – In response to a request-for-information on vehicle recharging stations that was issued in 2008, the City of San Jose has employed the services of Coulomb Technologies to install and test vehicle recharging stations that will be attached to City streetlight poles

Expand Community Shuttle Service

Based on the finding of past and forthcoming studies on the City's shuttle services, expand the frequency and range of service to meet increasing demands.

The City of Menlo Park manages an extensive shuttle program that provides "around town" transportation to many residents, employees, and visitors. The program includes the following services:

Two fixed-route, peak-hour shuttles that travel between the Caltrain station and the business parks and office complexes along Marsh Road and Willow Road;

The Midday shuttle, which provides transportation to medical facilities, Little House, Menlo Park Senior Center, downtown Menlo Park, the main library, the Belle Haven library, Safeway, the Caltrain station, the Veterans Affairs hospital, Stanford Shopping Center, and several senior housing facilities.

The Shopper's shuttle, which operates one day a week and primarily serves seniors who do not live near the fixed route of the Midday shuttle. The Shopper's shuttle provides service to those requiring transportation for personal needs.

Expansion of the shuttle service will be analyzed in the upcoming A.M. Residential Shuttle study. The purpose of the study is to identify the needs and desires of the residents for an a.m. residential shuttle to the Menlo Park Caltrain station. This study will not only be an operational analysis and service design but also will account for the community vision and purpose in reducing the City's carbon footprint.

- Emissions Reduction Estimate – 0.5 metric tons CO_2e per rider annually
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – $15,000 approved by Council to study the Shuttle Service, implementation costs TBD with study.
- Payback Period – N/A
- Implementation Timeframe – N/A

Implement Bike Improvements

In many ways, Menlo Park offers an ideal biking environment as it is largely flat and has a relatively good biking climate. The City recognized this in 2004 by developing and adopting the Comprehensive Bicycle Development Plan, which outlined the existing status of bicycle facilities and priority projects and estimated the implementation costs of those projects. A majority of projects identified strengthen and expand the existing bike roadway network and there are some major capital improvements related to the Caltrain station.

These improvements, if coupled with non high-priority projects in the Plan, such as adequate end-of-trip bike facilities on public streets and in large private developments, could significantly increase the bicycle share of the modal split in Menlo Park.

All of the high-priority projects identified in the Comprehensive Bicycle Development Plan would be funded by traditional transportation funding mechanisms at the regional, State and Federal level. While the City is pursuing funding for these projects, ICLEI recommends that the City also pursue the least cost strategies (such as education and safety programs) and policy approaches (TDM and bike parking ordinances for private development) regardless of the priority identified in the Plan. Some of these improvements could include Wayfinding and Bike Route Signage. This new signage would be relatively low cost when compared to the overall plan. This will help maximize the benefits of any new bike capital projects created, and it may also allow the City to shift some implementation costs on to private developers (see TDM strategies in new development).

- Emissions Reduction Estimate – 9,000 metric tons CO_2e by 2020. Projected 2020 bicycle trips total 16,623 trips per weekday, an increase of 10,427 trips per day over 2004 conditions. Emissions reductions calculations assume that all new bike trips replace one car trip (which will create some overestimate of total emissions reductions) and that the average length of trips replaced will be five miles.

- Cost per metric ton of CO_2e Mitigated – $460

- Total Cost for Implementation – Short Term: $91,000. Mid-Term: $85,500. Long Term: $3,949,000. $4.12 million total (in 2004 dollars, based on the Menlo Park Comprehensive Bicycle Development Plan). Operation and maintenance costs will add, on average $26,500 per year, over a 10 year period.

- Payback Period – TBD

- Implementation Timeframe – 2015 – 2020

Enhance Recycling Collection Services

Expanded recycling services will be implemented citywide in January 2011. Residential services will include weekly collection of recyclables, plant materials, and solid waste. Appropriate numbers of carts will be delivered to single-family and multi-unit residential complexes. One cart will be used for all recyclable items, including bottles, cans, paper, cardboard and several types of plastic. Another cart will be used for plant and tree trimmings, untreated wood, leaves, grass, and possibly food scraps. The third cart will be used for whatever small amount of waste is not recyclable or compostable. Household batteries, cell phones, used motor oil and filters will also be collected weekly.

Customers will be able to put all recyclables in the same container. They will also have the option of collection service for mixed plant trimmings, food scraps and waxed cardboard at a discounted rate ("organics", which the City might want to prohibit from garbage containers). Compostable materials could be prohibited to further increase diversion rates.

Single stream recycling is expected to increase diversion of bottles, cans, paper and plastic by about 15 percent. If food waste, paper towels/cups/plates, and other compostable materials are included in the collection service, there could be another 15 percent increase in tonnage diverted from the landfill. The amount of solid waste landfilled may decrease correspondingly. If there is a 15 percent decrease (5,260 metric tons of solid waste) in material landfilled due to increased recycling resulting from single stream service, there could be an annual reduction of 18,200 metric tons of CO_2e.[16]

Emissions Reduction Estimate – 18,200 metric tons CO_2e (assuming 5,260 MT of addional solid waste will be recycled, as opposed to put in landfill. Avoided emissions from landfill waste and upstream energy benefits were included in this calculation).

- Cost per metric ton of CO_2e Mitigated – $265
- Total Cost for Implementation – Garbage rate increase of approximately 9.5 percent
- Payback Period – N/A
- Implementation Timeframe – 2011

[16] The emissions reduction number was calculated using the EPA's WARM model. An emission factor set was used that does not account for sequestration of carbon in landfills, but does include avoided emissions due to reduced upstream energy use as result of recycling versus using virgin materials for making products.

4.4 Emission Reduction Strategies Requiring Further Analysis

The following strategies will need further research on cost, payback, and/or emission reduction quantification.

Incentives for Building Practices that Reduce Energy Consumption Beyond Current Code

Currently the City provides an incentive in the form of a no-fee permit for the installation of photovoltaic cells installed on residential roofs. As a way to encourage builders, business owners, and homeowners to exceed State energy efficiency and green building standards, an incentive could be offered to offset construction costs and promote environmental sensitive construction design.

The reuse of building materials, whether from the existing building or obtained locally from a building salvage supplier, reduces greenhouse gasses at the material extraction and manufacturing levels by reducing the demand for new products. Obtaining salvaged building materials from a local supplier reduces greenhouse gasses by diminishing the transportation distance. While these emission savings are significant, an estimate of potential CO_2 reductions is currently not available.

Tankless water heaters reduce energy consumption by 10 to 15 percent because heat is lost through the walls of a conventional water heater storage tank. A conventional water heater is designed to maintain the water in the tank at a near constant temperature so energy is consumed even when no hot water is being used.

Eligible design elements could include:

- Measurement and verification systems to monitor energy used by different energy-consuming systems in the building, which provides useful data about building systems performance and identifies potential maintenance needed for performance optimization.
- Reuse of as many building materials as possible in the existing building or areas of the building that are being altered
- Materials Selection in the remodeling of homes and office spaces should give preference to materials that are:
- Reclaimed, salvaged, or refurbished;

- Contain a high percentage of recycled content;
- Made from rapidly renewable materials;
- Harvested and manufactured locally or regionally;
- Distributed using low-carbon transportation technologies; and
- Made from wood that has been certified by the Forest Stewardship Council (FSC).
- Photovoltaic Cells installed on roofs of non-residential buildings to reduce energy consumption supplied by PG&E.
- Solar Water Heaters installed on roofs to preheat building water, reducing the temperature differential between the unheated water and the heated water.
- Tankless Water Heaters to reduce energy consumption by heating water on-demand, instead of maintaining a volume of water at a near constant temperature.
- Whole House Fans to offset or replace air conditioning units, while using significantly less energy.
- Passive Solar Design to maintain interior thermal comfort throughout the sun's daily and annual cycles, while reducing the requirement for active heating and cooling systems.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Varies depending on materials selection
- Total Cost for Implementation - TBD
- Payback Period – N/A
- Implementation Timeframe – N/A

Early Implementation of California Green Building Code Standards

Local governments in California will the see the rollout of a first in the nation, statewide mandatory green building code in 2010. The code will go into effect on a voluntary basis in January 2009. Among the changes that the code will result in are a 20% improvement in water use efficiency, 50% increase in water conservation, and 15% reduction in energy consumption in all new construction. Rather than designing their own green building code, or adopting a standard such as LEED or Build-It-Green, the Menlo Park Community Development Department could begin promoting the State Green Building Code standards in advance of 2010.

From 2011 onwards, Menlo Park should look for opportunities to adopt standards that exceed the State Green Building code where there is opportunity to do better. As a part of the review cycle of the State Green Building Code, City of Menlo Park staff in the Community Development Department should submit feedback and look to influence future additions and amendments.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – Unknown
- Payback Period – Unknown
- Implementation Timeframe – N/A

City Car Sharing Program

Car sharing programs have been shown to provide multiple social, economic, and environmental benefits to the community. Car sharing increases equity by improving the mobility options of people who are transportation disadvantaged thus assisting them in job searching and employment. People who participate in these programs are more likely to reduce their vehicle miles traveled while increasing their public transit use. As a result of this reduced personal vehicle use, the amount of CO_2 as well as other pollutants associated with vehicle emissions is reduced. Several cities, including Portland, Philadelphia, and Berkeley and Emeryville in the Bay Area have each implemented car sharing programs, each partnering with a local for-profit car sharing company, with slightly different logistical arrangements.

Zipcar might consider coming to Menlo Park for a municipally-sponsored car-sharing program if they could be convinced that it is possible to get around Menlo Park without a car, and that Zipcar would provide additional mobility for people choosing to forego a personal auto completely. They want to partner with a city that's very public transportation-friendly.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – TBD
- Payback Period – Unknown
- Implementation Timeframe – N/A

Limit Commercial Vehicle Idling

Exhaust from motor vehicles is a substantial contributor to air pollution and a source of carbon monoxide, particulate matter, toxic air contaminants, and greenhouse gases. Such pollutants are harmful to the environment as well as to the public's health. Air pollution has been linked to causing and aggravating acute respiratory infections, asthma, chronic bronchitis, emphysema, and lung cancer[17]. While idling for 15 minutes, the average vehicle uses 0.048 gallons of fuel and emits 0.94 lbs. of CO2[18]. If idling times are restricted to a maximum of 3 minutes, this would result in an 80% reduction of fuel consumption and CO2 emissions related to idling. Using this information, if 100 cars (idling 15 minutes/day, 5 days/week) reduced their idling to a maximum of 3 minutes/day, over 8.2 metric tons of CO2 would be reduced annually.

The City of Menlo Park could implement a public outreach program on reducing idling. As of 2006, 30 states have already enacted anti-idling regulations at various levels of government. These regulations generally limit a vehicle's idling time to a maximum of 3 to 5 minutes with an escalating penalty scale for repeat offenders. Exemptions to anti-idling restrictions are granted to emergency vehicles, zero emission vehicles, and vehicles stopped in traffic.

It is recommended that city staff draw upon existing sets of laws passed in California when creating Menlo Park's anti-idling policy.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – TBD
- Payback Period – Unknown
- Implementation Timeframe – N/A

Auburn, CA – An operator of a vehicle may not allow an engine to idle at any location for more than five consecutive minutes. Violators of this ordinance are subject to a written warning on the first offense, followed by a $100 minimum civil penalty for a second offense, with a minimum civil penalty of $200 for all future offenses and criminal penalties as provided by law.

[17] EPA. *Compilation of State, County, and Local Anti-Idling Regulations.* (April 2006)
[18] Calculated based on data from the Automobile Association http://www.theaa.com/public_affairs/news/cut-traffic-queues-to-cut-co2.html

Transportation Demand Management Strategies

Transportation Demand Management refers to a set of diverse strategies that are aimed at reducing vehicle use on City roads and highways. These strategies can be enacted by any level of government and run the gambit from alternative insurance pricing structures to increased bike parking. Each of these strategies has its own associated costs and benefits and each would have varying impact on greenhouse gas emissions in Menlo Park. In addition to greenhouse gas emissions reductions, many of these strategies can have co-benefits, including revenue generation, increased quality of life, reduced traffic, and travel cost reduction for residents and employees of Menlo Park businesses. Strategies that would best apply to residents of Menlo Park could include:

- Increased shuttle services
- Bike/transit integration
- Implementing recommended bike improvements in Menlo Park Comprehensive Bicycle Development Plan (highlighted below)
- Targeted pedestrian improvements
- Rideshare programs
- Flextime and telecommute incentives to businesses
- Car sharing (Portland, OR)
- Taxi improvements

Strategies that could be targeted at businesses and their employees include:

- Commuter financial incentives
- Transit passes (Santa Clara Valley Transportation Authority ECO Pass)
- Commute trip reduction (flextime and telecommuting incentives)
- Parking cash out programs

- Transportation Management Associations
- Commuter financial incentives

Parking strategies such as Parking Improvement/Benefit Districts, variable parking pricing, parking requirement reductions for new developments, in-lieu fees for developers to reduce the number of parking space provided or parking taxes could also be implemented. Other TDM programs such Least-Cost planning and Intelligent Transportation Systems could also be implemented.

- Emissions reductions and costs are not calculated for this strategy due to the high variability in program selection and participation.

Transportation Demand Management Strategies for New Developments

The City has already developed recommended TDM Guidelines for new developments, which encourage the development of bike facilities, shuttles and other alternative modes of transportation for new major developments. This is a strong first step and will have some effect on overall travel. The City may also consider requiring developments over a certain size threshold (e.g., 10-unit residential developments or commercial developments of a certain square footage) to include TDM strategies (or grant them an in-lieu waiver fee), especially for those developments that are likely to be major destinations or generators of traffic or are near the Caltrain, future Dumbarton Rail or other future transit stations. In exchange for the added expense to developers, the City can provide automatic benefits such as reduced parking requirements, permit process waivers, density bonuses or other benefits that will reduce the developer's expense and time.

Menlo Park could build on its existing analysis of the proposed project-level TDM strategies to review which of the strategies would result in the largest changes in greenhouse gas emissions, and which would promote or spurn developer interest in Menlo Park. Once a more targeted suite of development strategies has been identified, the City will need to include these strategies in their permit-review processes as regular practice. It is also advisable that, during and after construction, inspection and other evaluation is conducted to verify that proposed strategies are implemented.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – Staff costs for policy development and administration
- Payback Period – Unknown
- Implementation Timeframe – N/A

Zero Waste Plan and Target

While “zero waste” may sound like a vision for a distant green future, many cities are taking steps to make it a reality sooner. In the waste management world, the term “zero waste” is a goal to divert all, or nearly all, waste materials from landfills. In order to accomplish this, all organic material is composted, spread as mulch, burned for bio-fuel, or put to other uses. All other materials and products are designed for recycling or re-use. There would be an attempt to completely eliminate over time all non-recyclable and non-compostable consumables and durable goods, including packaging, food containers, plastics, metals, electronics, and everything else that is currently making its way into landfills. And of course, reduction in material use and discard through efficiencies and conscientious behaviors are encouraged across the board. Currently in the US, no cities have achieved zero waste, but a growing number are setting targets to reduce their waste to zero in the next 15 years or so. Most cities with zero waste goals have also adopted interim targets so that they can focus their efforts on short term progress.

Significant ground has already been broken in the arena of zero waste planning by cities in California and elsewhere. The zero waste plan adopted by the City of Palo Alto (73% diversion rate by 2011 and zero waste by 2021) is a good model. Through joint efforts, the SBWMA member agencies could benefit from economies for planning, education, new collection programs, and infrastructure (ownership of the Shoreway Road recycling facility in San Carlos).

Bay Area local governments that have adopted targets include:

Berkeley – 75% by 2010; Zero Waste by 2020
Marin County – 80% by 2012; Zero Waste by 2025
Oakland – 75% by 2010; Zero Waste by 2020
Palo Alto – 73% by 2011; Zero Waste by 2021
San Francisco – 75% by 2010; Zero Waste by 2020
San Jose – 75% by 2013; Zero Waste by 2022

Greenhouse gas emission reduction potential can be roughly estimated using the total landfilled waste tonnage for the community of Menlo Park that was calculated as a part of the 2005 Baseline Emissions Inventory Report. 35,070 metric tons of solid waste was sent to the landfill, resulting in the release of 17,486 metric tons of CO_2e over the lifetime of the waste.[19] According to the Palo Alto Zero Waste Plan, achieving zero waste will cost approximately $100 per metric ton of CO_2e reduced annually. The cost per metric ton increases as more CO_2e is reduced (the first ton is much cheaper than the last ton).

- Emissions Reduction Estimate – 17,500 metric tons CO_2e (after achieving zero waste)
- Cost per Metric Ton of CO_2e Reduced – approximately $100 annually
- Total Cost for Implementation – $20,000-50,000 to create a plan; up to approximately $2 million to achieve zero waste over 15 years. Could be included in garbage rates over several years.
- Payback Period – N/A
- Implementation Timeframe – N/A

[19] Greenhouse gas emissions were calculated using a version of the EPA's Waste Reduction Model (WARM).

Required Recycling Service for Commercial Facilities

In 2009, staff may propose to the City Council a new ordinance requiring larger commercial waste generators to recycle certain materials. If approved, the ordinance and related procedures would likely be developed by the SBWMA staff, in consultation with City staff, and implemented by Allied Waste/Republic Services by the end of 2009. Emissions reductions and costs are not calculated for this strategy due to the high variability in service selection and participation.

Construction & Demolition Debris Ordinance Amendments

Construction and demolition (C&D) waste is a major contributor to landfills. To help divert this type of waste, Menlo Park created an ordinance in 2001 that requires construction and demolition projects to recycle, reuse and/or salvage at least 60 percent of total estimated debris, of which a maximum of 35 percent of the recycled material can be concrete, asphalt, rock, or brick. However, contractors and Menlo Park staff have identified shortfalls in the current policy related to the refunding of the deposit placed by the contractor. The ordinance is difficult to enforce because proof of recycling may be based solely on "tags" or receipts given to the driver when the material is delivered to a recycling facility; these tags may be handwritten and are easily lost, duplicated, or misinterpreted.

At some point in the next few years, it is very likely that the State will mandate a C&D landfill diversion level of about 75 percent. The City could begin to work toward this goal by strengthening and clarifying its C&D ordinance and procedures, so that Menlo Park will be well on the way to compliance when the law does go into effect. Considerable tonnage can be diverted from landfills to existing recycling facilities and salvage operations.

Potential amendments to the current ordinance could include:

1. Require 75 percent of all debris from demolition, new construction, and roofing projects to be reused, salvaged, composted or recycled.
2. Provide an incentive for salvaging.
3. Require 100 percent of inerts to be reused or recycled.
4. Lower the size threshold for projects to be covered under the diversion requirements.
5. Specify the purpose for which unrefunded deposits may be used (administrating and publicizing the ordinance).

It is likely that the South Bayside Waste Management Authority will work with local C&D facilities in 2009 to standardize the weight tags/receipts so that it will be easier to process deposit refunds. In addition, they will consider certifying the facilities to ensure diversion to viable uses and publicize the facilities. Emissions reductions and costs are not calculated for this strategy due to the high variability in future requirements.

Menlo Park Municipal Water District Conservation Programs

Reducing consumption of water conserves energy and reduces emissions, and reduces the volume of water requiring treatment at wastewater treatment plants. In the Menlo Park Municipal Water District (MPMWD), energy needed for water treatment and delivery is primarily for pumping due to the high quality of water available from the San Francisco Public Utility Commission (SFPUC) Hetch Hetchy water system. Energy is also required for wastewater pumping and treatment. In addition, wastewater treatment processes produce methane, carbon dioxide and trace amounts of other gases.

Existing conservation activities and services performed by MPMWD include:

- Water Conservation Staff
- Conservation Rates
- Water Conservation Incentive Programs
- High Efficiency Toilet Rebates
- Residential and Commercial Washing Machine Rebates
- Free Water Conservation Items (Nozzles, Leak Detection Tablets, Educational Materials)
- Large Landscape Audit Program
- Water Efficient Landscaping Classes

In the future, the MPMWD will continue its participation in regional conservation efforts as well as maintaining its conservation rate structure, conservation staffing and outreach efforts to the extent feasible. Additional water conserving programs and projects could include completion of a municipal water audit, replacement of turf grass fields with artificial turf, support for recycling of grey water or use of non-potable for irrigation.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown

- Total Cost for Implementation – Unknown
- Payback Period – Unknown
- Implementation Timeframe – N/A

Landscape Ordinance Update

The City of Menlo Park's Water Efficient Landscape Ordinance (Chapter 12.44) was adopted by City Council in 1992 and is in need of updating. The care and maintenance of vegetation surrounding homes and business has a significant impact on local water use and air quality (grass trimming equipment). More strict requirements for turf area and water use would have multiple sustainability benefits as well as reducing greenhouse gas emissions. The timing for this update corresponds well with the finalization of the State of California's Landscape Ordinance Update. On January 31, 2009 the State Department of Water Resources will distribute the final, updated Landscape Ordinance (AB 1881). The Ordinance will include information on applicability, adjustment factors for regional climatic variability, and documentation requirements.

The new ordinance will require the City to annually survey and compare customers' landscape water use to local reference evapotranspiration and identify customers whose landscapes exceed 80% of local reference evapotranspiration rate for at least one year, to the extent that customer water use information is available to the water agency. The City must also annually conduct landscape irrigation audits on a minimum 20% of the total customer landscapes—customer will pay the cost of these audits. By January 2010, local governments must adopt the new State Landscape Ordinance or one that is at least as effective as that adopted by the Department of Water Resources. In 2011, the ordinances of local governments will be reviewed (if an ordinance is different than that adopted by the State) and compliance will be reviewed.

- Emissions Reduction Estimate – Unknown
- Cost per Metric Ton of CO_2e Mitigated – Unknown
- Total Cost for Implementation – Unknown
- Payback Period – Unknown
- Implementation Timeframe – N/A

Section Five: State & Regional Strategies

State & Regional Strategies

5.1 State and Regional Strategies that will Reduce Emissions in Menlo Park

There are a number of major emission reduction strategies that the California Air Resources Board (CARB) has proposed in the current version of the AB 32 Scoping Plan that will have a direct effect of reducing emissions in the City of Menlo Park. Considering these emission reductions alongside the local strategies that are proposed in this plan is important for understanding the complete future picture. All emission estimates are reductions achieved in 2020 within the geographic boundaries of Menlo Park. These numbers were calculated by analyzing the emission reduction estimates in the AB 32 Proposed Scoping Plan and scaling these down to reflect the local effects in Menlo Park based on indicators such as projected number of households, energy use, commercial building area, etc. Emissions calculations were made in order to avoid double counting among strategies on the list below and in the local strategies described elsewhere in this document.

5.1.1 Transportation Strategies

The following are statewide strategies that will reduce emissions from the Transportation sector within Menlo Park:

- Express and local transit, HOT/HOV lanes, commuter rail, freeway optimization, AB 1493 (Pavley Bill), Low Carbon Fuel Standard, etc.
- 20-25% reduction in transportation sector emissions by 2020 (46,000 – 58,000 Metric tons CO_2e).

- Changes in land use patterns that are carried out as a result of SB375
- These strategies are estimated to result in up to 7% reduction in transportation emissions beyond other local, regional, and State transportation strategies (up to 20,000 metric tons CO_2e).

5.1.2 Energy Efficiency for Electricity and Natural Gas in Residential and Commercial Sectors

Statewide strategies for the Energy sector that will benefit Menlo Park include:

- Utility Energy Efficiency Programs
- Building and Appliance Standards
- Additional Efficiency and Conservation Programs
- These strategies are estimated to result in a combined 10% reduction in emissions (21,000 metric tons CO_2e).

5.1.3 Statewide Green Building Code

Implementation of California's Green Building Code is estimated to achieve a 10% reduction in overall emissions (21,000 metric tons CO_2e).

5.1.4 33% Renewable Portfolio Standard

This strategy is anticipated to reduce greenhouse gas emissions from electricity consumption by 24% (28,000 metric tons CO_2e).

5.1.5 Million Solar Roofs Program

The statewide target of 3,000 MW total installation by 2020 (2.4 MW in Menlo Park) is expected to result in a 6% reduction in electricity use at the local level (7,000 metric tons CO_2e).

The combined total of these statewide strategies is estimated to achieve an annual reduction of 123,000 metric tons CO_2e in Menlo Park by 2020.

Section Six: Recommended Greenhouse Gas Reduction Targets

Greenhouse Gas Reduction Targets

6.1 Greenhouse Gas Reduction Targets

It is important that the City of Menlo Park adopts emission reduction targets for both municipal operations and the larger community at the same time that it adopts its plan for short term greenhouse emission reduction strategies in order to have goals to strive for and to benchmark progress. Many factors need to be considered when adopting reduction targets. The targets should be meaningful, realistic, and ambitious. These three aspects are determined by a combination of:

- Political and Financial Feasibility
- Scientific/Ecological Imperative
- Local and Regional Growth Patterns
- Current and Future State Strategies
- Input and Willingness of Stakeholders
- Targets of Peer Communities

In California, perhaps more so than any other State, climate change mitigation strategies that local governments undertake need to be informed by strategies being taken by State and regional entities. The aggressive climate change mitigation agenda being crafted by the California Air Resources Board includes specific programs that will reach all sectors of emissions and the economy. The role that local governments will play in the State's climate

plans is also in the process of being articulated. The local emission reduction target recommendations for Menlo Park that follow are significantly influenced by the current and planned strategies of the California Air Resources Board, the California Energy Commissions, the California Building Commission, the California Integrated Waste Management Board, the Governor's Office and State Congress, and other State bodies.

For both the municipal target and community target, ICLEI and the Climate Action Plan team are putting forth several alternatives for City Council to consider for adoption.

"Business-as-usual" (or worst case) scenario forecasts assume that emissions will continue to increase at the same rate as they did prior to the 2005 inventory, and that neither the State nor individuals will take action that results in an emissions reduction. Such a scenario is unrealistic given that building codes, vehicle emission standards and energy technology continue to advance and improve in both efficiency and pollution prevention. The "business-as-usual" scenario does, however, provide the only current means of comparison between 2005 emissions and the results of implementing recommended strategies.

6.1.2 Municipal Operations Target

Option 1 – The City adopts a target that is equal to the sum of the emissions reductions of all of the strategies described in this plan.

- *2012 Target* - For municipal operations, an ambitious but achievable target would be 210 metric tons of annual reductions within 3 years, which would be equivalent to 10% below 2005 levels if emission levels do not increase under a "business as usual" scenario.

- *2020 Target* - Within 10 years, the City would reduce annual emissions by 560 metric tons (26%) if the strategies in the climate action plan were implemented.

Pros – The Council and City staff will have targets that are directly connected to the strategies that are recommended in the climate action plan. The City would have a very high likelihood of meeting the targets if all of the strategies are implemented.

Cons – Adopting a target that is based on the implementation of all strategies in the climate action plan may be overly ambitious if one or more of the larger emission reduction strategies are not implemented.

Option 2 – Adopt a State's goal to reduce emissions to 1990 levels by 2020. This is roughly equivalent to reducing emissions 15% below 2005 levels by 2020.

Pros – Menlo Park would clearly be in-line with identified State priorities for reducing emissions at the local government level. The probability of achieving this target is quite high.

Cons – Adopting the State's target would require the City to identify additional emission reduction strategies beyond those contemplated in this plan.

6.1.3 Community Target

Option 1 – The City adopts a target that is equal to the sum of the emissions reductions of all of the strategies described in this plan.

- *2012* - At the community scale the analysis indicates that emissions would increase 4% percent from 2005 levels if the strategies in the action plan were implemented (as compared to an 8% growth under a "business-as-usual," worst case scenario forecast).
- *2020* - The City could expect to see a decrease of 3% below anticipated 2020 levels if the strategies in the action plan were implemented.

Pros – The Council and City staff will have targets that are directly connected to the strategies that are recommended in the climate action plan. The City would have a very high likelihood of meeting the targets.

Cons – The emissions reductions that appear to be achievable by implementing the strategies in the climate action plan alone are small. The community scale targets may not be acceptable to the residents of Menlo Park because they will not result in a net reduction in emissions. Peer communities have enacted targets that are significantly more aggressive.

It should be noted that this estimated reduction does not account for strategies implemented by businesses, schools, community groups and individuals working without guidance or assistance from the City or the State such as voluntarily lowering thermostats, turning off lights, choosing lower impact products, driving less, etc.

Option 2 – Adopt a target in line with the State's goal to reduce emissions to 1990 levels by 2020. This is roughly equivalent to reducing emissions 15% below 2005 levels by 2020.

Pros – In the current version of their Proposed Scoping Plan for reducing California's greenhouse gas emissions under AB 32, the California Air Resources Board (CARB) recommends that local governments adopt targets that are in line with the State's.

> "In addition to tracking emissions using these protocols, CARB encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the State commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020" (AB 32 Proposed Scoping Plan, pg 27).

Cons – Much of the emissions reductions that would need to take place in order to meet the target would not come from strategies in the climate action plan. Regional and State emission reduction strategies would need to account for a significant percentage of the emission reductions that are achieved in Menlo Park. Many of the State and regional programs are likely to be developed and implemented five to ten years in the future. In order to meet this reduction target, the City would need to invest additional time in planning reduction strategies if it does not want to be dependent on higher levels of government to be responsible for a majority of the emission reductions needed to reach the target.

Section Seven: Implementation Recommendations

Implementation Recommendations

7.1 Summary of Near Term Strategies

7.1.2 Municipal Operations Strategies

Table 15 below presents near term strategies and impacts related to Municipal Operations. Estimated costs are presented for strategies where sufficient data is available.

Table 15: Summary of Near Term Strategies - Municipal Operations

Strategy Name	Annual Emission Reduction Potential	Costs (to the City)	Cost Per MT CO_2e	Payback Period	Implementation Timeframe
Climate and Energy Coordinator	Unknown	$150,000 per year	N/A	N/A	2009
Enhanced Transit Pass/Carpooling Programs	22 MT CO_2e	$50,000	$2,300	NA	2009
PG&E ClimateSmart	720 MT offset	$9,000 annually to offset GHG emissions from municipal electricity and natural gas use	NA	NA	2009 (On-Going)
Marsh Road Landfill Methane Mitigation	25,000 MT CO_2e by 2020	$0	$0	N/A	2009 (Ongoing)
Plant Trees	2 MT CO_2e	$15,000 per year plus maintenance costs	NA	N/A	2009 (On-going)
Energy Audits for City Facilities; Retrofit as Needed	1- 100 MT CO_2e annually	TBD	TBD	Variable	2009 (On-Going)

Solar PV Panels for City Facilities	20kW system, generating 36,000 kWh of electricity per year would eliminate up to 15 MT of CO_2e	$100,000 + 1/10 FTE	$333	25 years	2009 - 2013
Environmentally Preferable Purchasing Program	1 - 100 MT CO_2e annually	$10,000 + ¼ FTE ongoing	$10 - $10,000	Variable	2010
Install Water Efficient Fixtures in All City Buildings	Minor	$50,000	$3,000 to $50,000	25 years	2010
Sharon Heights Pump Station Control Upgrades	12 -24 MT CO_2e	$0	NA	NA	2010
Solar Heating for Belle Haven Pool	2,000 square foot swimming pool; 2,810 term reduction in natural gas use; 19 MT CO_2e	$75,000 + 1/20 FTE	$1,875	17years	2010
Roofing for City Buildings - Reflective and Energy Star	60,000 square feet of roofing converted; 58,126 kWh reduction per year; 1,012 term increase per year; 8 MT annual reduction	$90,000 + 1/10 FTE	$12,250	2.9 years	2010 - 2015
Enhance Recycling Collection Services	357 MT CO_2e	15% increase in collection costs	TBD	N/A	2011
LED Streetlights Downtown along Santa Cruz Ave (Short Term) and Entire City (Long Term)	Short Term: 3 MT CO_2e	$35,000	$28,000		2011
	Long Term: 118 MT CO_2e	$1.6 million for entire city	N/A	32 years	2015 - 2020

7.1.2 Community Strategies

Table 16 below presents near term strategies and impacts related to strategies that could be implemented by the community with leadership or support provided by the City. Estimated costs are presented for strategies where sufficient data is available. It is important to note that this list does not include emission-reducing strategies residents and businesses will undertake on their own whether for greenhouse gas reduction, economic or other reasons.

Table 16: Summary of Near Term Strategies - Community

Strategy Name	Annual Emission Reduction Potential	Up-front Capital Costs	Cost Per MT CO_2e	Payback Period	Implementation Timeframe
Residential Energy Audit Program (Green@Home)	113 MT CO_2e after year 1 (additive). 565 MT CO_2e after 5 years.	50 hours + $37,000 annually	$265	N/A	2009 – On-Going
Energy Efficiency and Renewable Energy Financing Program	77 MT CO_2e annually for residential and 155 MT CO_2e annually for commercial sector. (232 total). Additive each year of the program.	$75,000 + .8 FTE annually to administer	$185	20 yrs. for loan repayment	2009 - 2012
Expand Community Shuttle Service	0.5 MT CO_2e per rider annually	$15,000 (for study)	N/A	N/A	2009 – 2012 (for study)
Enhancements to Recycling Services	18,200 MT CO_2e	9.5% increase in collection rates	$265	N/A	2011
Electric and Plug-in Hybrid Vehicle Recharging Station	7,000 MT CO_2e	$45,000 for 30 stations	$7	N/A	2012 - 2015
Implement Bike Improvements	9,000 MT CO_2e	$91k (short-term) $85.5k (mid-term) $3.949 mil (long-term)	$460	N/A	2015 - 2020

Section Eight: Conclusion

Conclusion and Next Steps

Climate change is a pressing concern for cities and towns across the United States and around the world, and is at the forefront of policy today. In order to change direction along this dangerous and unknown course for our climate, it is clear we need to change our daily actions and the way we live our lives. However, in the wake of increasing atmospheric greenhouse gas levels and retreating glaciers, new technology, innovation, jobs, and policies are emerging that can lead us down a more sustainable path into the future.

Menlo Park has displayed great leadership and foresight in choosing to confront this issue, and has already implemented a number of important strategies to reduce emissions. In addition to mitigating its contribution of greenhouse gases, Menlo Park stands to benefit in many other ways from the proposed strategies outlined in this report. By undertaking these strategies, Menlo Park will save money, improve air quality and public health, enhance community livability, boost the local economy, and showcase the City's commitment to climate protection.

This report quantifies the sources of Menlo Park's emissions and lays out near and mid-term strategies to meet proposed greenhouse gas emissions reduction targets. Meeting these targets will require both persistence and adaptability. It will require the cooperation and enthusiasm of the residents and businesses, and the participation of other local governments and regional and State agencies. This conclusion begins to outline the steps the City will need to take to ensure the target is met, coordination is established, resources are sustainable, and progress is monitored and reported.

8.1. Administration and Staffing

A key part of effectively implementing this climate action plan is assigning and defining management responsibilities for each of the individual components of the plan. As such this report has identified the need for the creation of a Climate and Energy Coordinator position and associated staff support to help guide the implementation of strategies outlined within this Plan. In addition, designated officials and staff members serve as the initial points of contact and the drivers of the initiatives; in order to make this process effective and efficient these roles need to be defined and carried out going forward.

Successfully implementing the climate action plan will affect all parts of Menlo Park's operations; fleet operators will need to work to improve fleet fuel efficiency, planners will need to develop energy efficiency policy and provide outreach to residents, landfill operators will need to address methane emissions from the Marsh Road landfill. For this reason, it is important that policymakers and senior staff provide clear and consistent direction to all staff members that implementing this plan is a priority and that they will be required to examine how they can incorporate the outlined strategies into their regular work. It is important that the City maintains a culture of sustainability, where greenhouse gas considerations are aligned with other priorities.

8.2. Public Involvement in the Implementation Process

To reduce emissions from Menlo Parks businesses and homes, the City will need to engage the public at all stages of future work. Employers and residents will not only be responsible for reducing their own emissions, but they can serve as messengers to the people with whom they live and work, and provide incentives for further emissions reductions. It is therefore important to identify a clear and accessible network of not only City employees and officials, but also community members to help carry out the implementation process. To that end, Menlo Park will need to explore effective opportunities to involve these stakeholders in the development, review, and implementation of this plan. Luckily, the City already has an active network of residents engaged on this topic who will help make this plan a reality. As part of this process, the City should carefully monitor and document successes and lessons learned as part of the community outreach and education campaign.

8.3. Financing and Budget

Implementation of this plan will require a significant investment of time and resources, both of which are very scarce in light of the recent economic downturn. The City must be strategic in its adoption of these approaches, likely focusing on those that have the highest emissions reductions per dollar spent, the lowest capital outlay, or those that result in cost savings in the near term. For example, some municipal operations strategies could be incorporated into existing practices with minimal costs, and many energy efficiency upgrades (for example LED streetlights) have a relatively quick payback period. A Climate and Energy Coordinator position is one of the most important initial strategies outlined in the plan, would achieve both integration of climate work and eventually have the potential to pay for itself through energy efficiency and other cost reductions.

Menlo Park should continually look for opportunities to incorporate the strategies outlined in the plan as part of the annual budget process. The City should also seek additional funding in the form of State and Federal grants and low interest loans to help finance more expensive strategies, as well as sustainable and strategic public investments by the City, State, Federal and Regional government agencies. In addition, Menlo Park should explore partnerships that can help to leverage resources, both financial and staff, to help implement appropriate strategies.

Finally, the City should invest time developing new funding mechanisms for financing many of the strategies. This will allow the City to have a more stable funding source for greenhouse gas emissions reductions programs rather than relying on competitive and infrequent grants. Many localities and the State are already devising these innovative funding approaches. For example, the Berkeley FIRST program provides opportunities for homeowners to borrow from cost savings to finance energy efficiency projects in their homes. Similarly, revolving loan funds, provide opportunities for local governments to fund greenhouse gas and cost-saving projects with a minimal amount of startup capital. The City should also consider participating in the proposed California Cap and Trade program, which could result in direct and indirect benefits to the City for reducing greenhouse gas emissions from municipal operations.

8.4. Timeline and Monitoring

In order to begin to implement the strategies outlined in the plan, the City will need to set priorities by creating a timeline for implementation of the plan. At the same time, the City should also set up an evaluation mechanism which assesses both the success of the implemented strategies and the progress against the implementation timeline. In this way, the City will create the basis for an adaptive management strategy that provides the city with a number of benefits; it will allow the City to respond to existing financial and political realities and it will increase accountability for implementing departments and provide an incentive for quicker progress. It will also allow for consistent and transparent reporting to the community and other stakeholders, further building the relationship between the City and the community.

One of the most important ways that Menlo Park can evaluate its progress is through updating their greenhouse gas emissions inventory and measuring progress against the 2005 baseline. The City should re-inventory at least every five years from the baseline year, but ICLEI advises that the City monitor emissions levels on a more frequent basis.

Finally, within a few years, the City should begin to incorporate more mid- and long-term strategies into an updated version of the Climate Action Plan. As regional and State greenhouse gas reduction plans further evolve and near implementation, the City should articulate how it will be a participant in these efforts.

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Appendix 3 – References

General Resources

AB 32 Scoping Plan
http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

Association of Bay Area Governments (ABAG)
http://www.abag.ca.gov

Bay Area Air Quality Management District (BAAQMD)
http://www.baaqmd.gov

California Air Resources Board
http://www.arb.ca.gov/homepage.htm

California Climate Action Registry
http://www.climateregistry.org

California Energy Commission (CEC)
http://www.energy.ca.gov

Environmental Protection Agency
http://www.epa.gov

ICLEI – Local Governments for Sustainability
http://www.icleiusa.org

Intergovernmental Panel on Climate Change (IPCC)
http://www.ipcc.ch

Menlo Park Greenhouse Gas Emissions Analysis
http://www.menlopark.org/departments/eng/GreenhouseGas.pdf

PG&E's Climate Smart Program
http://www.joinclimatesmart.com

San Francisco Bay Conservation and Development Commission
http://www.bcdc.ca.gov

San Mateo County Energy Strategy, 2012
http://www.ccag.ca.gov/pdf/USTF/reports/USTF071307%20Energy_Strategy_draft.pdf

Climate and Energy Coordinator Resources

http://www.saanich.ca/climate/climatedetails.html
Climate Protection Grant Program- Santa Clara County was awarded a $75,000 grant from the Bay Area Air Quality Management District (BAAQMD) and was able to fund a Utility Program Manager & Climate Coordinator.
http://www.baaqmd.gov/pln/climate_protection_grant_program.htm

Energy Efficiency Resources

Building Energy Consumption Resources

Database of State Incentives for Renewables & Efficiency (DSIRE)- California Incentives for Renewables and Efficiency
http://www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=CA&RE=1&EE=1

California State Green Building Code Standards Resources

The California Building Standards Commission
http://www.bsc.ca.gov

California Green Solutions- This site outlines some of the updates to California's Green Building Codes as well as suggestion strategies to achieve these standards.
http://www.californiagreensolutions.com/cgi-bin/gt/tpl.h,content=2430

Green @ Home Energy Awareness Program Resources

PG&E energy efficiency and rebate programs: http://www.pge.com/myhome/saveenergymoney/rebates

GreenCitizen electronic recycling locations
http://greencitizen.com

Acterra
http://www.acterra.org

LED Street Lights Resources

LED City Initiative
http://www.ledcity.org/applications/street-parking-lot-lighting.html

Ann Arbor Program

http://blog.mlive.com/annarbornews/2007/10/ann_arbor_to_install_led_stree.html

Environment in Palo Alto
http://www.cityofpaloalto.org/environment/default.asp

Reflective and Cool Roof Resources

EPA Energy STAR roof calculator (www.roofcalc.gov)

ENERGY STAR Reflective Roof Products- This site has multiple resources, links, articles, and case studies regarding reflective roofing.
http://www.energystar.gov/index.cfm?c=roof_prods.pr_roof_products

Roofing Comparison Calculator- Estimate the savings of installing a reflective roof.
http://www.roofcalc.com/

Environmentally Preferable Purchasing Program Resources

Electronic Product Environmental Assessment Tool**-** EPEAT is a system to help purchasers evaluate, compare and select desktop computers, notebooks and monitors based on their environmental attributes.
http://www.epeat.net/

The EPA and the CIWMB offer resources to help local governments implement an EPP program:
EPA- Environmentally Preferable Purchasing Online Training
http://www.ofee.gov/gp/training.asp

CIWMB- California Integrated Waste Management, Environmentally Preferable Purchasing
www.ciwmb.ca.gov/EPP/

State and Local Government Pioneers: How State and Local Governments Are Implementing Environmentally Preferable Purchasing Practices.
http://www.epa.gov/epp/pubs/case/statenlocal.pdf

ENERGY STAR
http://www.energystar.gov

City of Long Beach, Environmentally Preferable Purchasing Program
http://www.longbeach.gov/civica/filebank/blobdload.asp?BlobID=12446

King County, Environmental Purchasing Program
http://www.metrokc.gov/procure/green/

Green Procurement
http://www.greenbiz.com/toolbox/essentials_third.cfm?LinkAdvID=32453

LEAP- Local Authority Environmental Management and Procurement

http://www.iclei-europe.org/index.php?id=3113

EPA, Environmentally Preferable Purchasing
http://www.epa.gov/opptintr/epp/

Landscape Ordinance Resources

Department of Water Resources- Updated Model Water Efficient Landscape Ordinance AB 1881
On November 26, 2008, the Department of Water Resources released the "Notice of Modifications to the Proposed Regulation" (the Model Water Efficient Landscape Ordinance). These modifications are in response to comments received during public comment period in February and March 2008.
http://www.owue.water.ca.gov/landscape/ord/updatedOrd.cfm/

EPA- Beneficial Landscaping
http://www.epa.gov/greenkit/landscap.htm

EPA- Water Efficient Landscaping: Preventing Pollution &Using Resources Wisely
http://www.epa.gov/npdes/pubs/waterefficiency.pdf

Renewable Energy Resources

Renewable Energy Financing Program Resources
AB 811 Bill
http://info.sen.ca.gov/pub/07-08/bill/asm/ab_0801-0850/ab_811_bill_20080721_chaptered.pdf

Berkeley FIRST
http://www.cityofberkeley.info/ContentDisplay.aspx?id=22196

Palm Desert - Energy Management
http://www.cityofpalmdesert.org/Index.aspx?page=304

CPUC - Renewables, Energy Efficiency and the Environment
http://www.cpuc.ca.gov/PUC/energy/environmatters.htm

Solar Photovoltaic Resources

City of San Carlos, CA- Solar photovoltaic system on the city's corporation yard
http://www.renewableenergyworld.com/rea/partner/story?id=28317

City of Santa Fe, NM- Proposed solar photovoltaic system
http://www.santafenewmexican.com/Local%20News/Harnessing-the-sun#

SPG Solar
http://www.spgsolar.com
This company designs, builds, and supports solar projects for a wide range of customers including local and state government agencies.

Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 –2006, ES-16;
http://www.epa.gov/climatechange/emissions/downloads/08_ES.pdf

Transportation Resources

Anti- Idling Resources

EPA. *Compilation of State, County, and Local Anti-Idling Regulations*. (April 2006)

ICLEI. Sustainable Transportation Options for Protecting the Climate: A Guide for Local Governments. (2001)

Sacramento Draft Model Limitation on Engine Idling Ordinance. (May 2003)
http://www.airquality.org/modelord/EpisodicModelIdlingOrd.pdf

United States Environmental Protection Agency. Compilation of State, County, and Local Anti-Idling Regulations. (April 2006)

U.S. Department of Transportation. *CMAQ and Idle Reduction Techniques*. (October 2005)
http://www.fhwa.dot.gov/environment/cmaqpgs/idlereduct/index.htm

The Automobile Association. *Idle Lights Not Good for the Environment*. (April 2008)
http://www.theaa.com/public_affairs/news/cut-traffic-queues-to-cut-co2.html

Automobile Association
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Sacramento Draft Model Limitation on Engine Idling Ordinance. (May 2003)
http://www.airquality.org/modelord/EpisodicModelIdlingOrd.pdf

Bicycle Infrastructure Resources

Victoria Transport Policy Institute-Bicycle Infrastructure Information
http://www.vtpi.org/tdm/tdm85.htm

Benefit-Cost Analysis of Bicycle Facilities
http://www.bicyclinginfo.org/bikecost/

Car Sharing Resources

Cities for Climate Protection. *Green Fleet Policy Ordinance*.
http://www.cleanaircounts.org/content/Green%20Fleet%20Policy%20Ordinance.pdf

Denver Metro Convention & Visitors Bureau. *All Aboard the Green Fleet:* Denver's Pioneering No-Smog Strategy. (2008)
http://www.denver.org/metro/features/green-fleet

City of Seattle. *Earth Day 2003 Resolution*. (April 2003)
http://cityofseattle.org/environment/Documents/EarthDayRes2003.pdf

Sustainable Oregon. *Green Fleet*.
http://www.sustainableoregon.net/toolkit/green_fleet.cfm#what

U.S. Department of Energy. *HEV Cost Calculator Tool*. (2008)
http://afdc.energy.gov/afdc/hev_calculator/fleet.php

Berkeley's CarShare Program Press Release
http://www.ci.berkeley.ca.us/Mayor/PR/pressrelease2005-0316.htm

Berkeley's Sustainability Program Overview Presentation (April 2008)
http://www.mmanc.org/Portals/24/Events/Region%201/City%20of%20Berkeley%20Go%20Green%20PPT.pdf

City of Austin's vanpooling program for commuters
http://www.rivercitiesrideshare.com/en-US/

Emeryville Zipcar Program Taking Off (May 2008)
http://abclocal.go.com/kgo/story?section=news/local&id=6122630

San Francisco City CarShare: Second-Year Travel Demand and Car Ownership Impacts (November 2003)
http://communauto.com/images/TRB2004-002025.pdf

City to Join PhillyCarShare, Cut 400 Vehicles (April 2004)
http://www.phila.gov/pdfs/City_to_Join_PhillyCarShare.pdf

Zipcar Website
http://www.zipcar.com

Litman, Todd. *Evaluating Carsharing Benefits*. (December 1999)
http://www.islandnet.com/~litman/carshare.pdf

Citizen Education on Trip Reduction Resources

City of Palo Alto- Way 2 Go program
http://www.cityofpaloalto.org/depts/pln/news/details.asp?NewsID=206&TargetID=107

City of Palo Alto- Commuting Program
http://www.cityofpaloalto.org/depts/pln/transportation/commuting.asp

Multi-Modal Access Guides
http://www.vtpi.org/tdm/tdm113.htm

City of Portland- SmartTrips
http://www.portlandonline.com/transportation/index.cfm?c=43801

Commuter Trip Reduction Resources

http://www.vtpi.org/tdm/tdm9.htm

Electric and Plug-in Hybrid Electric Vehicle Charging Stations Resources

Better Place
www.betterplace.com

Coulomb Technologies
www.coulombtech.com

Plug-in Partners
http://www.pluginpartners.org

Clean Car Maps
www.cleancarmaps.com

PG&E
http://www.pge.com/mybusiness/environment/pge/fleets/

Calstart
www.calstart.org

Employee Trip Reduction Program Resources

http://www.gtacleanaironline.ca/portal/user/anon/page/default.psml/js_peid/main/media-type/html/language/en;jsessionid=91FBF211208612DE1C68F9350E8F7B39?action=controls.Restore&portalid=ContentPageType%3A007&yzpage=7747&yzlookfeel=basic

Bay Area Air Quality Management District (BAAQMD)- *Regulation 13, Rule 1*
http://www.arb.ca.gov/drdb/ba/curhtml/r13-1.htm

Green Fleet Resources

http://www.denver.org/metro/features/green-fleet

Municipal Shuttle Service Resources

Victoria Transport Policy Institute- Shuttle Service
http://www.vtpi.org/tdm/tdm39.htm

Emery Go Round- Free shuttle service in Emeryville, CA.
http://www.emerygoround.com/

Parking Improvement/Benefit Districts Resources

MTC's Parking Toolbox
http://www.mtc.ca.gov/planning/smart_growth/parking_seminar/Toolbox-Handbook.pdf

Victoria Transport Policy Institute-TDM Encyclopedia
http://www.vtpi.org/tdm/

CCAP (Center for Clean Air Policy, 2005) *CCAP Transportation Emissions Guidebook – Part One: Land Use, Transit & Travel Demand Management.*

Wang, Haobo. June 2008. *Good Practices of TDM for Emission Reduction: A Review.* Paper presented at: Energy, Transport and Sustainability Symposium, June 2008

Transportation Demand Management Resources

MTC's Parking Toolbox
http://www.mtc.ca.gov/planning/smart_growth/parking_seminar/Toolbox-Handbook.pdf

Victoria Transport Policy Institute
http://www.vtpi.org/tdm/

Massachusetts EPA Developer Protocol Information
http://www.mass.gov/envir/mepa/pdffiles/misc/GHG%20Policy%20FINAL.pdf

Solid Waste Resources

IPCC 2006. *Guidelines for National Greenhouse Gas Inventories*. Intergovernmental Panel on Climate Change.

Landfill Gas Emissions Model (LandGEM).
United States Environmental Protection Agency (USEPA), 1998. AP 42 Emissions Factors, Solid Waste Disposal, pg. 2, 4-6.

Methane to Markets- Compilation of landfill methane capture and use resources and case studies
http://www.methanetomarkets.org/events/2005/all/breakout-landfill.htm

California Integrated Waste Managmanet Board (CIWMB)- Landfill Methane Capture Strategy
http://www.ciwmb.ca.gov/climate/Landfills/default.htm

EPA- Landfill Methane Outreach Program (LMOP)
http://www.epa.gov/lmop/overview.htm

Recycling Resources

www.RethinkWaste.org (SBWMA website)

Construction and Demolition Waste Resources

Justifications for Recommendations Construction & Demolition Ordinance Changes (source: Tracie Onstad-Bills, SBWMA)

California Integrated Waste Management Board (CIWMB)- Developing a C&D Ordinance
http://www.ciwmb.ca.gov/LGLibrary/CandDModel/Instruction/

City of Concord, CA- Construction & Demolition (C&D) Materials Recycling Ordinance
http://www.cityofconcord.org/living/recycle/cdordinance.htm

Zero Waste Plan Resources

San Jose Zero Waste Homepage Timeline
http://www.sjrecycles.org/business/zerowaste/timeline.asp

Berkeley Zero Waste Commission
http://www.cityofberkeley.info/ContentDisplay.aspx?id=13122

City of Palo Alto's Zero Waste Operational Plan
http://www.cityofpaloalto.org/depts/pwd/recycle/news/details.asp?NewsID=897&TargetID=180
Link to http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=7139

Del Norte Zero Waste Plan
This zero waste plan is the first of its kind in the U.S. It describes policies and strategies for reaching zero waste in Del Norte (CA). Other communities aiming for zero waste will find this plan essential reading.
http://www.forester.net/mw_0106_del.html

San Francisco's Zero Waste Resolution

Urban Forest Resources

iTree
http://www.itreetools.org/stratum.shtm

ICLEI. Talking Trees: An Urban Forestry Toolkit for Local Governments. (November 2006)

California Climate Action Registry. *Urban Forest Project Reporting Protocol*. (August 2008)

Stokes, Trevor. "Trees give more to the community than shade," *Florence Times Daily*.

(November 25, 2007)
http://www.timesdaily.com/article/20071125/NEWS/711250345

Water Resources

Efficient Water Fixtures Resources
EPA WaterSense - http://www.epa.gov/watersense/
Software for Water and Energy Savings from Appliances -
http://www1.eere.energy.gov/femp/information/download_watergy.html

Solar Thermal Water Heating for Pool
US Department of Energy, Energy Efficiency and Renewable Energy Program -
http://www1.eere.energy.gov/solar/sh_basics_pool.html

City Water Pumps Resources

City of Palo Alto's Emergency Water Supply Project- This site provides information regarding the City's emergency water supply project (including the Mayfield Pump Station upgrade).
http://www.pafd.org/depts/utl/faqs/emergency_water_supply.asp#1013
http://www.pumpefficiency.org/
PG&E: Pumping Efficiency Improvements Guide
http://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/inforesource/agricultural_pumping_efficiency_improvements.pdf

Appendix 4 – About ICLEI

Local Action Moves the World

ICLEI-Local Governments for Sustainability (ICLEI) is a membership association of local governments committed to advancing climate protection and sustainable development. Since its inception in 1990, ICLEI has grown to include nearly 1,000 cities in the world, more than 500 of which are in the United States.

At ICLEI USA our mission is to build, serve, and drive a movement of local governments to advance deep reductions in greenhouse gas emissions and achieve tangible improvements in local sustainability.

ICLEI's Five Milestones for Climate Protection

The Five Milestones provide a simple, standardized means of calculating greenhouse gas emissions, of establishing targets to lower emissions, of reducing greenhouse gas emissions and of monitoring, measuring and reporting performance.

The methodology underlying the Five Milestones provides a simple, standardized means of calculating greenhouse gas emissions, of establishing targets to lower emissions, of reducing greenhouse gas emissions and of monitoring, measuring and reporting performance. ICLEI has developed a software tool, Clean Air Climate Protection (CACP), that helps cities comply with the methodology.

ICLEI's Five Milestone Methodology for setting and meeting your climate mitigation goals:

1. **Conduct a baseline emissions inventory and forecast**
   The city first calculates greenhouse gas emissions for a base year (e.g., 2000) and for a forecast year (e.g., 2015). The calculations capture emissions levels from all municipal operations (e.g., city owned and/or operated buildings, streetlights, transit systems, wastewater treatment facilities) and from all community-related activities (e.g., residential and commercial buildings, motor vehicles, waste streams, industry). This inventory and forecast provide a benchmark for planning and monitoring progress.
2. **Adopt an emissions reduction target for the forecast year**
   The city passes a resolution establishing an emission reduction target for the city. The target is essential. It both fosters political will and creates a framework that guides the planning and implementation of strategies.
3. **Develop a Local Climate Action Plan**
   The local government then develops a Local Climate Action Plan, ideally with robust public input from all stakeholders. The plan details the policies and strategies that the local government will take to reduce greenhouse gas emissions and achieve its emissions reduction target. Most plans include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff. In addition to direct greenhouse gas reduction strategies, most plans also incorporate public awareness and education efforts.

4. **Implement policies and strategies**
   The city implements the policies and strategies contained in their Local Climate Action Plan. Typical policies and strategies include energy efficiency improvements to municipal buildings and water treatment facilities, streetlight retrofits, public transit improvements, installation of renewable power applications, and methane recovery from waste management.
5. **Monitor and verify results**
   Monitoring and verifying progress on the implementation of strategies to reduce or avoid greenhouse gas emissions is an ongoing process. Monitoring begins once strategies are implemented and continues for the life of the strategies, providing important feedback that can be use to improve the strategies over time. ICLEI's software provides a uniform methodology for cities to report on strategies.